

FACT SHEET FOR NPDES PERMIT WA0037214
CITY OF TACOMA NORTH END PLANT NO. 3

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System (NPDES) permits, which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the state of Washington to administer the NPDES permit program. Chapter 90.48 Revised Code of Washington (RCW) defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	City of Tacoma
Facility Name and Address	City of Tacoma North End Plant #3
Type of Treatment	Physical/Chemical with a biological tower and chlorine disinfection
Discharge Location	Outer Commencement Bay Latitude: 47° 17' 16" N Longitude: 122° 29' 00" W.
Water Body ID Number	Old ID# WA-10-0010, New ID# 47122C418

BACKGROUND INFORMATION

DESCRIPTION OF THE FACILITY

The City of Tacoma North End municipal treatment plant #3 discharges to outer Commencement Bay. The facility collects wastewater from an area that is all residential. There are some commercial restaurants and retail stores, but there are no industrial or other commercial facilities that discharge non-municipal wastes to the treatment works. The facility uses a unique combination of chemical and physical settling of solids followed by a biological trickling tower to enhance Biochemical Oxygen Demand (BOD) removal. Disinfection is achieved by chlorination that is continuously monitored and computer metered. Sludge is trucked to the Tacoma Central Wastewater Treatment Plant where it presently enters the head works but will in the near future be added directly to the Central Plants sludge digesters.

HISTORY

The North End Tacoma plant began operation in 1969 to provide primary treatment. This original plant was only capable of treating to the primary removal standard. Design capacity prior to the upgrade in the early 1990s was 10 million gallons per day (mgd), with 25.0 mgd maximum peak hourly flow. The plant is located in Mason Gulch, a deep drainage ravine cut into a bluff overlooking Commencement Bay on the east side of Point Defiance. Mason Gulch is fronted by Waterview Street near the intersection of 40th Street, a short distance from Ruston Way and Commencement Bay.

In June 1985, the Department issued Order No. DE 85-429 requiring the facility to complete construction and comply with secondary treatment standards by February 1, 1991. The facility was also required to eliminate several overflow points in the collection system and bypasses. In 1987, the City of Tacoma began a pilot project to evaluate the physical/chemical (P/C) process that is still used today. An Engineering report on the P/C process for the North End facility was approved in November 1989. The facility as originally constructed was not able to meet secondary standards for BOD with just the P/C process. Therefore in the early 1990s, a biological trickling filter was added to the process.

The last Permit for the North End facility was issued on June 29, 1990. Modifications to that permit were issued with one on September 30, 1992, and a second on May 20, 1993. The 1993 modification corrected an erroneous latitude location for the outfall. The 1992 modification included an order as part of a settlement of a dispute concerning monitoring of the discharge. The order included acute and chronic biomonitoring and sediment monitoring as well as a requirement to determine a mixing ratio and mixing zone definition.

The 1990 permit required that chlorine removal be installed, required a copper reduction evaluation, and required reduction of inflow and infiltration (I/I). All of these have been implemented in some sense. Instead of using a chemical chlorine removal system, the North End facility installed a computer operated chlorine monitoring and disbursement system that has resulted in very low chlorine residuals.

In January of 1994, a final consent decree stipulated that the City of Tacoma upgrade the North End treatment facility to comply with secondary treatment standards. The upgrades included headworks modification, flow monitoring, standby power, the elimination of overflows, I/I reduction, and the addition of the biofilter device for reduction of BOD. The consent decree included a monetary penalty and other requirements. The elements of the consent decree have been accomplished. New I/I work is being done on other parts of the system. Instead of standby power located on-site, the facility has two

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major power sources. Each power source serves a different part of the city. Both power feeds come into the plant and there is an automatic switching system in case one of the power sources fails.

COLLECTION SYSTEM STATUS

The City of Tacoma's North End service area comprises approximately 6,200 acres which are predominantly residential in land use. The age of parts of the collection system range from modern to 90 years or older (Parametrix, 1994). The trunk line draining the older area consists of 6,600 feet of 21 to 30-inch concrete that was built in 1910. The City of Tacoma has implemented an extensive I/I program of identifying and replacing the older and leaking parts of the collection system. The City has used video monitoring on many areas to set priorities for repair.

Some of the rehabilitation program activities the City is currently pursuing include the development of a rehabilitation guideline/design manual to standardize and increase the efficiency of rehabilitation project design and construction. Manhole rehabilitation will continue as needed.

From I/I reports submitted to the Department for the last several years, the I/I is described as the highest monthly average flow minus the lowest monthly average flow. The I/I averaged as follows:

Year	I/I (mgd)	Percent of average design flow (7.2 MGD)	Sewer line added or replaced (feet)
2001	3.7	51%	136
2000	2.7	38%	0
1999	4.4	61%	901
1998	4.5	63%	1,733
1997	4.6	64%	711
1996	5.4	75%	0
1995	4.3	60%	1,764

The facility established a base of 4.0 mgd in 1982. The facility was ten percent over that base in 1999. But was under the base in 2000 and 2001. During the period of 1995 to 2001 an additional 5,245 feet of sewer lines were added or replaced. From the table above it is not clear if the line replacement is the cause of the drop in I/I during 2000 and 2001. The city continues to disconnect foundation and roof drains as it finds them. Due to the age of the collection system and the difference in summer and winter flows, the city will need to continue its I/I program and reporting in the next permit.

The North End facility is rated at 7.2 mgd for an average design flow and a maximum weekly flow of 10.5 mgd. The design population equivalent is 54,300. Population is now at 54,300 and flows have exceeded 85 percent for more than three months. In the 1990 permit S5A and B specified that when the actual flow exceeded 85 percent of the design capacity for three consecutive months that the city should plan to address the flow. One major point the city has made is that the service area is not growing—it is fully built out.

The collection system has three remaining points where overflows may occur during storm events. These overflows are sanitary sewer overflows (SSO). The remaining SSOs include the following discharge points:

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<u>Discharge No.</u>	<u>Location</u>	<u>Receiving Water</u>
3001	40 th and Waterview	Commencement Bay
3003	Ruston & Steele St.	Commencement Bay
3005	Ruston & Gove St.	Commencement Bay
3006 (potential discharge)	6503 Westwood Ln. N	The Narrows

Under the 1994 Consent Decree, there were requirements that upgrades to the system include “elimination of overflows, [and] infiltration and inflow (I/I) reduction.” Appendix B of the Consent Decree specified the changes to the collection system that needed to occur and included the following elements:

- 1 Installation of check valves on each of the four overflow structures on the Ruston Way sanitary interceptor;
- 2 plugging of all other known cross-connections between storm and sanitary sewer mains;
- 3 separation or plugging of all storm-water catch basins known to be connected to the sanitary sewer;
- 4 installation of depth monitors on both the storm and sanitary sides of each of the four overflow structures;
- 5 weekly inspection of overflow monitors from October through April and bi-weekly inspection from May through September, or more frequently during periods of heavy rainfall; and
- 6 separation of roof drains connected to the sanitary system from 200 of the 235 known sites.

All of these items were completed in the early 1990s with the exception of item six. The last item number six was slated to have been completed in the late 1990s. In 2002, Tacoma disconnected 239 out of 250 identified homes with roof drain connections. Because all work under the Consent Decree has been completed, the overflows will be deemed to no longer exist. Any future overflows may be considered violations.

The City of Tacoma has approximately one million dollars to spend in the North End service area on main-line capitol improvements. The City has begun design to rehabilitate approximately 45,000 lineal feet of mostly 8-inch sewer. Approximately 15 manholes were rehabilitated in 2002. The City has an inspection program to identify foundation drains and sump pump connections. During 2002 the City inspected 343 out of 348 homes. Investigators found and redirected sump pump connections and 24 gravity foundation drains.

TREATMENT PROCESSES

The facility uses a combination of physical and chemical addition followed by a biological filter and finally chlorine disinfection. A schematic of the facility may be found in Appendix C.

The flow enters the plant and first passes a bar screen. Flow is pumped up to an elevation that allows gravity flow through the rest of the plant. Flow passes through ¼-inch bar screens and any solids removed are sent to a screening washer at the local solid waste transfer station.

Flow then passes a Parshall flume with a continuous ultra-sonic flow meter. Aluminum Sulfate (Alum) is then added before the flow enters a grit removal tank. Grit removed from the tank is washed and trucked

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to the local solid waste transfer station for disposal. Flow leaving the grit tank enters a flow diversion box that splits the flow to two sedimentation tanks where a polymer is added. Scum and sludge from each step is sent to a sludge holding tank where it is trucked off site to the Tacoma Central plant for treatment. Flow from the sedimentation tanks is sent to a biofilter which consists of a two story tower where the wastewater is sprayed into and through corrugated plastic sheets. The biofilter goes through a daily scour cycle where the filter plastic is flushed and the flow is sent back to the head of the grit tank for settling. The flow is sent to the chlorine contact tank where the chlorine is electronically monitored and dosed to achieve the lowest possible residual and most effective disinfection. The final discharge is to an outfall diffuser in Commencement Bay that begins approximately 900 feet from shore in 120 feet of water at mean lower low water (MLLW) tide level.

Within the collection area of this system, there are no industrial or commercial businesses other than restaurants and shopping centers. As a result, there are no suspected toxic chemicals other than those typically found in municipal treatment plant discharges. Only a basic pretreatment program will be needed for this facility in the event that a more large scale industry locates in this area. More about pretreatment will be discussed in the pretreatment section.

The facility is unique and difficult to classify with the physical chemical portion of the plant. The biofiltration portion of the facility along with the design flow being less than ten mgd rates the facility as Class III. If the facility is later re-rated at more than ten mgd then it may be reclassified to Class IV. The facility is not considered tertiary treatment.

The operators for this facility must be certified as having at least a group III Classification. There are three group IV operators and one group III operator at this plant that also rotate working on the Central Tacoma plant. The plant is staffed 12-hours per day 6-days per week and 8-hours on Fridays. The facility has an extensive alarm system and telemetry to alert operators during the off hours.

There are no outstanding grants or loans to the City of Tacoma for the North End facility at this time. There do not appear to be any plans to expand this facility at this time and the service area is built out and not growing.

DISCHARGE OUTFALL

The outfall extends, from a drop manhole in the seawall along Ruston Way, to approximately 900 feet offshore in outer Commencement Bay (see Appendix C for a map of the outfall). The outfall was extended in 1990 from 720 feet an additional 180 feet. A multi-port diffuser is on the end of the 900 foot outfall and discharge depth ranges from 120 to 130 feet below sea level at MLLW. The diffuser is 32 feet long and has 6 ports that are spaced from 3 to 9 feet apart. The diameter of the ports range from 11 to 14 inches. The outfall has a hydraulic capacity of 26 mgd. The first port opens towards shore, two of the ports open at right angle to shore and towards the outer bay, two ports open in the opposite direction, and the last port opens out at a 45° angle towards the surface.

Secondary treated and disinfected effluent is discharged from the facility via the outfall into outer Commencement Bay.

RESIDUAL SOLIDS

The treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the grit tank and the sedimentation tanks, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local solid waste handling facility. Solids

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removed from the sedimentation tank are trucked to the Tacoma Central plant where it is currently re-introduced into a manhole upstream of the headworks of that facility. Tacoma is making upgrades to the Central Plant so that sludge from the North End plant may be introduced directly in to the Central Plant's sludge treatment train. Proposing changes to the Central Plant that will allow them to introduce the sludge from the North Plant into the Central plant's sludge digesters instead. This, however, has not occurred at the time of writing this permit.

PERMIT STATUS

The previous permit for this facility was issued on June 29, 1990. Two modifications to the permit were issued with the first on September 30, 1992, and the second on May 20, 1993. The first modification was in the form of an administrative order and added acute and chronic biomonitoring, sediment monitoring and a mixing zone dilution study to the permit. The second modification corrected the location of the outfall. Another administrative order was issued in 1993 as part of a final Consent Decree under which the City agreed to upgrade the North End facility to meet secondary standards. This upgrade included the addition of the biofiltration tower and the elimination of the sanitary sewer overflows along Ruston Way. The previous permit placed effluent limitations on flow, 5-day Biochemical Oxygen Demand (BOD₅), Total Suspended Solids (TSS), pH, and Fecal Coliform bacteria.

An application for permit renewal was submitted to the Department on December 22, 1999, and accepted by the Department on November 14, 2000.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

The facility received its last inspection on December 3, 2002. All systems appeared to be in order during that inspection.

During the history of the previous permit, the Permittee has largely remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. From 1997 through 2002, the only violations noted were for exceedance of flow of which there were six violations, all in 1999. There were also 14 warnings for flow exceeding greater than 85% of design capacity. More will be discussed about flow later in this fact sheet. There were three noted violations noted for discharge of raw sewage from sanitary sewer overflows. All three violations were noted in 2002, however, the electronic recordkeeping of sanitary sewer overflows in the Department's database did not occur until recently.

The facility has a laboratory on site that is accredited for General Chemistry and microbiology which includes BOD₅, dissolved oxygen, total chlorine residual, total suspended solids, and fecal coliform. Metals and other parameters must be analyzed at another facility.

WASTEWATER CHARACTERIZATION

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. The effluent is characterized as follows:

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Table 1: Wastewater Characterization (Based on DMR data from Jan. 2000-Dec 2002)

<u>Parameter</u>	<u>Average Monthly Concentration</u>	<u>95th Percentile of monthly</u>	<u>Old limit, design criteria, or standard</u>
Flow	4.6 mgd	7.3 mgd	7.0 mgd* (avg for max month) 10.5 mgd* weekly
BOD mg/L	14.2 mg/L	21.4 mg/L	30 mg/l monthly 45 mg/L weekly
BOD lbs/day	550 lbs/day	1,026 lbs/day	1,328 lbs/day monthly 3,940 lbs/day weekly 8,850 lbs/day (design load for max month)
BOD percent removal	94% avg removal	88% (5 th percentile)	85% minimum removal
TSS mg/L	7.7 mg/L	12.4 mg/L	30 mg/l monthly 45 mg/L weekly
TSS lbs/day	219 lbs/day	459 lbs/day	10,760 lbs/day (load for max month)
TSS percent removal	98% avg removal	95% (5 th percentile)	85% minimum removal
DO	8.8 mg/L	7.3 mg/L (5 th percentile)	6.0 mg/L min Class A criterion
pH	6.2 S.U. (5 th percentile)	6.8 S.U. (95 th percentile)	7.0 to 8.5 Class A criterion
Chlorine Residual	0.01 mg/L	0.05 mg/L max	0.75 mg/L max limit
Fecal Coliform	5.6 org./100ml geomean	56 org./100ml 90 th percentile 120 max	200 org./100 ml monthly 400 org./100 ml weekly

*The facility flow capacity was re-rated in 1994 from 7.0 mgd (max month) to 7.2 mgd and from 10.5 (weekly) to 11.2 mgd.

The flow for the North End facility has averaged 4.6 mgd, however, the 95th percentile flow is 7.4 mgd which is greater than the new design criterion of 7.2 mgd.

The BOD and TSS have been kept low and within limits. The facility installed the biofiltration tower in the early 1990s to increase the removal of BOD and TSS. It appears the system is working as designed and achieving greater than 85 percent removal and much lower than 30 mg/L BOD and TSS on a monthly basis. Table 1 shows the BOD 5th percentile at 88 percent removal. This means that 95 percent of the time the facility achieved better than 88 percent removal of BOD and better than 95 percent removal of TSS. The weekly concentrations are not shown in the table but were below 45 mg/L.

The dissolved oxygen (DO) discharged from the facility was usually discharged above the water quality standard of 6.0 mg/L which is extraordinary considering most facilities discharge DO in the 2.0 mg/L range and this facility has a mixing zone. The average value was 8.0 mg/L and the 5th percentile was 7.3 mg/L. More will be discussed on the final value at the edge of the mixing zone later in this document.

The pH discharged by the facility was generally kept within a narrow range of 6.3 for the lower 5th percentile and 6.8 for the upper 95th percentile. More will be discussed about pH later in the permit.

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The facility does not have any industry within the service area and toxic chemicals are not likely. The facility did effluent monitoring for a suite of metals, e.g., copper, lead, and zinc, etc. The results of this monitoring is shown in the reasonable potential table in Appendix C.

SEPA COMPLIANCE

There has been no recent construction or activity at the facility that has required State Environmental Policy Act (SEPA) notification at this time.

PROPOSED PERMIT LIMITATIONS

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria. The design criteria for this treatment facility are taken from 1994 engineering report prepared by Parametrix and are as follows:

Table 2: Design Criteria for North Tacoma WWTP (from Parametrix, 1994, Table 4.3 & 4.4)

Parameter	Design Quantity
Monthly average flow (max. month)	7.2 mgd
Maximum Daily flow	15.8 mgd
Weekly maximum 7-day flow	11.2 mgd
BOD ₅ influent loading	8,882 lbs/day
TSS influent loading	11,366 lb/day
Design population equivalent	54,300

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Tacoma has stated that the service area is not growing, is fully built out, and has reached full capacity. The population equivalents have exceeded the design of 49,600 people to 54,300, as reported in the 1994 Engineering Report and as now shown on I/I reports. The population number is based on census figures. It is possible that area housing is becoming more dense with the replacement of single family housing with apartments or large stores that would use more sewer capacity during operating hours than the houses it replaces. The influent loadings are from the 1994 Engineering Report.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD₅, and TSS are taken from Chapter 173-221 WAC are:

Table 3: Technology-based Limits.

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD ₅ (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Chlorine residual	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/liter.

The existing permit has a chlorine limit of 0.75 mg/L on a weekly basis and the facility is able to comply with it. However, the proposed permit will include a lower limit. This limit is discussed under the water quality based limits for toxic pollutants later in this document.

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The following technology-based mass limits for BOD and TSS are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Monthly effluent mass loadings for BOD was calculated as the maximum monthly influent design loading (8,882 lbs/day) x 0.15 = 1,332 lbs/day.

Monthly effluent mass loadings for TSS was calculated as the maximum monthly influent design loading (11,366 lbs/day) x 0.15 = 1,705 lbs/day.

BOD weekly average effluent mass loading is calculated as 1.5 x monthly loading = 1,998 lbs/day.

TSS weekly average effluent mass loading is calculated as 1.5 x monthly loading = 2,557 lbs/day.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

NARRATIVE CRITERIA

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

ANTIDEGRADATION

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned,

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the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in Chapter 173-201A WAC; therefore, the Department will use the designated classification criteria for this water body in the proposed permit. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

An ambient temperature of 13.2°C was used which represents the 90th percentile for the nearest ambient monitoring station in Commencement Bay. The upper 90th percentile for pH was 8.1 and the salinity was 22.4 g/Kg. These conditions produced the most conservative estimate of the ammonia criterion.

MIXING ZONES

The Water Quality Standards allow the Department to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Commencement Bay which is designated as a Class A receiving water in the vicinity of the outfall. Other nearby point source outfalls includes several dischargers at the head of the bay in the port area. All of these discharges are several miles away and would be influenced by the Puyallup River. Other than urban stormwater runoff, which is permitted separately, no other significant nearby point or non-point sources of pollutants are located along Ruston Way. The old Asarco smelter was located along the north end of Ruston Way just south of Point Defiance and is now a federal clean-up site. The City of Tacoma's Central plant discharges at the head of the bay.

Characteristic uses of Class A water include the following: water supply (domestic, industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

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SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	14 organisms/100 mL maximum geometric mean
Dissolved Oxygen	6 mg/L minimum
Temperature	16 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of the PLUMES dilution model (Parametrix, 1994). The dilution factors have been determined to be (from Appendix C):

	Acute	Chronic
Aquatic Life	45	101

Conditions in the outfall diffuser configuration and the facility flow have not changed since 1994. The dilution model was run 24 times with eight series of flows ranging from 4 mgd to 26 mgd. Each flow was run with current velocity at 10th and 90th percentiles.

In determining the dilution factors, the plant flow needed to be examined. The Department guidelines for dilution modeling states that when a facility is operating between 85 percent and 100 percent of dry weather design flow during the critical period then a peaking factor shall be applied to dry weather design to determine acute design flow. The peaking factor is a ratio of daily maximum to monthly average flows derived from actual plant data during critical period.

There were two periods where the facility was operating above 85 percent of capacity for three consecutive months. These periods of flow loading were November 2001 - January 2002, where the facility operated at 97 percent, 103 percent, and 94 percent on average during those months. November 1998 through February 1999, the facility operated at 101 percent, 116 percent, 105 percent, and 112 percent of design capacity on average. In our evaluation, the facility is not just operating between 85 percent -100 percent of capacity, but at times above design capacity. There were other periods of one or two months where the facility was exceeding 85 percent of design capacity.

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In calculating the dilution factors weather conditions and the flow records of the facility were examined for the last five years. The last two to three years were extremely dry and not truly representative. Because there was no dry weather design flow provided in the engineering report, the maximum monthly design flow of 7.2 mgd was used instead. The average of the yearly maximum values over the last five years was 5.75 mgd (the summer maximum during this period was 11.6 mgd). The summer average was 4.01 mgd. The peaking factor is $5.75/4.01=1.43$. The acute critical plant effluent flow is therefore $7.2 \times 1.43 = 10.3$ mgd. From Table 5.7 in the North End Engineering Report, the dilution would be 45.4:1 for acute dilution at 10 mgd.

For chronic dilution the critical plant effluent flow is defined as the dry weather design flow if the facility is operating between 85 and 100 percent of design. Because no dry weather design value was provided, the maximum monthly design flow of 7.2 mgd was used. From Table 5.7 in the North End Engineering Report, the dilution would be 101:1 for chronic dilution at 8 mgd. These values will be used for the chlorine residual limit and the WET limits. The WET limit will be 2.2 percent effluent.

CRITICAL CONDITIONS

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect. None of the metals, ammonia or chlorine examined showed a reasonable potential with the most stringent dilution factors (20 acute, 52 chronic).

The question of critical period may be different to some parameters when applied to Tacoma. Most of the toxic metals, chlorine and ammonia would be critical in the summer; however, the critical period for fecal coliform appears to be during the wet season. This is a conservative assumption that shows that there is not a problem with these toxic substances.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for Commencement Bay uses ambient data at critical conditions in the vicinity of the outfall. The ambient data was taken from the Department ambient monitoring data base from 1990 through 2000. The ambient water station is located in the center of commencement Bay at 47.2900° N latitude and 122.4483° W longitude. The ambient background data used for this permit includes the following:

Parameter	Value used
Velocity	3.4 – 1.7 cm/sec (at 12.5 – 27.5 meters depth, 10 th percentile.)
Depth	43 m
Temperature	13.2° C
pH (10 th & 90 th percentile)	7.6 – 8.1
Dissolved Oxygen (10 th percentile)	6.3 mg/L

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Total Ammonia-N	0.043 mg/L (2.3% unionized)
Fecal Coliform	75 org/100 mL
Salinity	22.4 (0/00)
All Metals	See reasonable potential table in Appendix C

BOD₅--Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for BOD₅ was placed in the permit.

The impact of BOD on the receiving water was modeled using simple mixing for dissolved oxygen, at critical condition and with the technology-based effluent limitation for BOD₅ described under "Technology-Based Effluent Limitations" above. The calculations used to determine dissolved oxygen impacts are shown in Appendix C. This discharge with technology-based limitations results in a small amount of BOD loading relative to the large amount of dilution occurring in the receiving water at critical conditions. Technology-based limitations will be protective of dissolved oxygen criteria in the receiving water.

Temperature--The impact of the discharge on the temperature of the receiving water was not modeled because no effluent temperature monitoring was required under the 1990 permit. However, with simple mixing, and assuming an effluent temperature of 20°C and an ambient temperature of 13.23°C, the predicted resultant temperature at the boundary of the chronic mixing zone is 13.30°C and the incremental rise is 0.07°C. Because this temperature increase is much less than the 0.3°C allowed in the water quality standards, a limit is not required, however, the monitoring will be needed to re-assess the actual effluent temperatures in the next permit and to assist with future dilution modeling if needed.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters. The facility was able to maintain effluent pH between 6.2 and 6.8 (standard units) 95 percent of the time.

Fecal coliform—The Department of Ecology's ambient monitoring station in the center of outer Commencement Bay showed fecal coliform was 75 org/100ml. This number is a 90th percentile based on the last five years of data. The water quality standard for fecal coliform has two parts. The first part is that a geometric mean of fecal coliform data must be less than 14 org/100ml which is met in both the ambient environment and by the facility. The second part of the standard requires that no more than ten percent of the data exceed 43 org/100 mL. The ambient data exceeds this number and the facility is not able to meet the criterion with mixing. Outer Commencement Bay is 303(d) listed for fecal coliform. The data from the ambient monitoring station confirms that listing.

It may be possible that the ambient monitoring station does not closely represent the conditions in the vicinity of the discharge. A water quality study in the vicinity of the discharge outfall may show that dilution is available. It is also possible that such a study in the vicinity of the outfall may show higher ambient fecal coliform, and therefore, that less dilution is available. If the Permittee chooses to conduct an ambient water quality study for fecal coliform, a study plan that includes quality assurance will need to be submitted to the Department for approval. Such a study is not required in the new permit.

A Performance-based effluent limit for fecal coliform is shown in Appendix C. The performance-based effluent limit represents what the facility can achieve with known, available, and reasonable treatment and should also be protective of water quality. The limits were determined using daily effluent data from January 2000 through December 2002 for a weekly and monthly limit. However, because there is a large data set of effluent data available, a monthly and daily limit can be calculated directly from the data by taking the 95th and 99th percentiles. A daily limit is not appropriate for fecal coliform and a 95th percentile

may produce too many violations. Therefore, the 99th percentile of the weekly and monthly geometric means was used to calculate the limits. A 99th percentile of seven-day geometric means of the daily data was used to determine the weekly limit. A 99th percentile was used to determine a monthly limit. There does not appear to be a great deal of seasonal variability in the effluent data for fecal coliform. Ambient fecal coliform levels do increase in the winter months, but this is not part of the calculation. The weekly limit is 64 col/100 ml and a monthly limit of 48 col/100 ml. Limits at these levels would have resulted in two weekly violations and two monthly violations over the three year period examined. However, the facility can increase the chlorine used for disinfection without causing chlorine toxicity and not have any violations.

At the present time, the facility is controlling the chlorine residual so as to minimize the chlorine toxicity and usage. The chlorine residual has a long term average of 10 µg/L. The chlorine will not be toxic at the acute mixing zone boundary until the chlorine is 13 µg/L which translates to an effluent value of 585 µg/L at the end-of-pipe. A chlorine limit is discussed in the Toxic Pollutants Section below.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: chlorine, ammonia, and heavy metals. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for (ammonia, copper, mercury, arsenic, lead, nickel, silver, zinc, chromium, and chlorine) to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs with low salinity, high ambient temperature and pH. The parameters used in the critical condition modeling are as follows: acute dilution factor 45, chronic dilution factor 101, receiving water temperature 13.2°C. The background levels for each pollutant may be found in the reasonable potential table in Appendix C. Background metals concentrations were determined from the Department study (Johnson, 1999) and a Battelle study (Crecelius, 1998). Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

Chlorine residual did not show a reasonable potential for violating standards. However, chlorine may need to be increased in order to meet the limit discussed above. To prevent the chlorine from exceeding the water quality criterion at the edge of the mixing zone, a chlorine limit will be required. A water quality limit table for chlorine residual can be found in Appendix C. While this chlorine limit is derived to protect water quality, it is a limit that can be met with the known, available, and reasonable treatment currently in use at the facility. The recommended chlorine daily limit is 0.59 mg/L and the monthly average limit is 0.22 mg/L. The chlorine residual is currently kept at 0.01 mg/L with very little variation. These new limits should allow room for the Permittee to reduce the fecal coliform and still not violate chlorine limits.

WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory

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tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity was measured during effluent characterization in the previous permit term. Acute toxicity was found to be at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. An acute toxicity limit is therefore required. The acute toxicity limit is: "no statistically significant difference in test organism survival between the acute critical effluent concentration (ACEC), 2.2 percent of the effluent, and the control." The acute test results are shown in Appendix C in a table labeled as "Acute WET test results as percent survival in 100 percent effluent." Results that were less than 65 percent survival indicate a problem. There were several incidents over the last several years.

The acute toxicity limit is set relative to the zone of acute criteria exceedance (acute dilution ratio, which is 45:1 or 2.2 percent effluent) established in accordance with WAC 173-201A-100. The acute critical effluent concentration (ACEC) is the concentration of effluent existing at the boundary of the acute mixing zone during critical conditions.

Monitoring for compliance with an acute toxicity limit is accomplished by conducting an acute toxicity test using a sample of effluent diluted to equal the ACEC (2.2 percent effluent) and comparing test organism survival in the ACEC to survival in nontoxic control water. The Permittee is in compliance with the acute toxicity limit if there is no statistically significant difference in test organism survival between the ACEC and the control.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sub-lethal toxic responses such as impaired growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical early life stage of a test organism. Organism survival is also measured in some chronic toxicity tests.

In accordance with WAC 173-205-040, the Permittee's effluent has been determined to have the potential to contain toxic chemicals. The acute toxicity test showed the need for an acute WET limit. Because it has been almost ten years since chronic toxicity has been tested and changes have been made to the facility, flow, and the community, a chronic toxicity characterization will be required in the permit in accordance with WAC 173-205-060. The proposed permit contains requirements for whole effluent toxicity testing as authorized by RCW 90.48.520 and 40 CFR 122.44 and in accordance with procedures in Chapter 173-205 WAC. The proposed permit requires the Permittee to conduct toxicity testing for one year in order to characterize the chronic toxicity of the effluent.

If chronic toxicity is measured during effluent characterization at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity, then the proposed permit will set a limit on the chronic toxicity. The proposed permit will then require the Permittee to conduct WET testing in order to monitor for compliance with a chronic toxicity limit. The proposed permit also specifies the procedures the Permittee must use to come back into compliance if the limits are exceeded.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC₅₀, EC₅₀, IC₂₅, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in

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receiving a copy of this publication may call the Department Publications Distribution Center (360) 407-7472 for a copy. The Department recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

When the WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water toxicity, the Permittee will not be given WET limits and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the applicant's discharge is unlikely to contain chemicals regulated for human health, and does not contain chemicals of concern based on existing data or knowledge. As stated earlier in this fact sheet, the service area has no commercial or industrial discharges. The discharge will be re-evaluated for impacts to human health at the next permit reissuance.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). See Appendix C for the Human Health Reasonable Potential Table.

SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of discharge and effluent characteristics that the Tacoma North End Plant discharge has no reasonable potential to violate the Sediment Management Standards.

Outer Commencement Bay is 303(d) listed for sediments for several parameters. These parameters include: 2,4-Dimethylphenol, acenaphthalene, benzoic acid, bis(2-ethylhexyl) phthalate, copper, diethyl phthalate, fluoranthene, N-nitrosodiphenylamine, naphthalene, phenanthrene, and total PCBs. Because there is no industry or commercial businesses in the Tacoma North End collection service area, there is very little likelihood that the items listed above are coming from the Tacoma North End Plant. At one time, there were several industries that discharged metals to Outer Commencement Bay. Copper is the main parameter of concern and may be found in most municipal discharges.

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In 1993 the City of Tacoma submitted a sediment sampling and analysis plan (SAP) in order to meet the permit requirements for the North End Plant. The SAP showed that the discharge is to a non-depositional area with a median current speed of greater than 6 cm/s. Previous tests showed that 75 percent of effluent particulate matter stays suspended for 24 hours. Video scans of the area near the outfall show very little accumulated sediment. The high current velocity reduces the likelihood of sediment contamination. The City requested that sediment monitoring be eliminated and the Department agreed. Future evaluations of the discharge may result in requirement for sediment sampling.

COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED IN 1990

Parameter	Existing Limits		Proposed Limits	
	Monthly Avg	Weekly Avg	Monthly Avg	Weekly Avg
Flow	7.0 mgd	10.5 mgd	7.2 mgd	11.2 mgd
BOD ₅	30 mg/L, 1,328 lbs/day Shall not exceed more than 15% of influent conc.	45 mg/L, 3,940 lbs/day	30 mg/L, 1,332 lbs/day Shall not exceed more than 15% of influent conc.	45 mg/L, 1,998 lbs/day
TSS	30 mg/L, 1614 lbs/day Shall not exceed more than 15% of influent conc.	45mg/L, 3940 lbs/day	30 mg/L, 1,705 lbs/day Shall not exceed more than 15% of influent conc.	45 mg/L, 2,557 lbs/day
Fecal Coliform Bacteria	200 col/100 ml	400 col/100 ml	48 col/100 ml	64 col/100ml
pH	Shall not be outside the range 6.0 to 9.0		Shall not be outside the range 6.0 to 9.0	
Total Residual Chlorine		0.75 mg/L	0.22 mg/L	0.59 mg/L
Copper	233.62 µg/L	92.61 µg/L	No limits	
Whole Effluent Toxicity test (WET limit)			Acute limit: No statistically significant difference in test organism survival between the acute critical effluent concentration (ACEC), 2.2 % of the effluent, and the control.	

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

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Monitoring for ammonia and metals are being required to further characterize the effluent. These pollutants could have a significant impact on the quality of the surface water.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for a plant of this size and type.

The Department's Permit Writers Manual allows the monitoring frequency to be readjusted based on the long term average of BOD. The BOD long term average was 14.2 mg/L and the limit is 30 mg/L. The ratio is $14.2/30=47$. Table Xiii-1A1 in the *Permit Writer's Manual* shows that monitoring at five days per week may be reduced to two days per week if there are no other problems with the facility. However, considering the nature of the facility being over loaded and operating near design capacity, it would be best not to reduce the monitoring below 3/week.

Additional monitoring is required in order to further characterize the effluent. These monitored pollutants could have a significant impact on the quality of the surface water.

As a pretreatment POTW, the City of Tacoma is required to have influent, primary clarifier effluent, final effluent, and sludge sampled for toxic pollutants in order to characterize the industrial input. Sampling is also done to determine if pollutants interfere with the treatment process or pass through the plant to the sludge or the receiving water. The monitoring data will be used by the City of Tacoma to develop local limits which commercial and industrial users must meet.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow. As stated earlier in the permit, the City of Tacoma has stated that they intend to re-rate the flow of the facility through an engineering evaluation. This re-rating may meet the needs of this permit requirement if the facility does indeed show that it is capable of meeting a higher flow and loading capacity.

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OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. The O&M manual for the facility was last approved by the Department in May of 2000. The manual should therefore contain all of the major updates, such as the biotower, the chlorination metering system, and the alum and polymer flocculation systems. The O&M manual is computerized and resides on the plant computers. Any future updates to the system will need to be reflected in the O&M manual with new updates.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by the Department under Chapter 70.95J RCW and Chapter 173-308 WAC. The disposal of other solid waste is under the jurisdiction of the Pierce County Health Department.

Requirements for monitoring sewage sludge and recordkeeping are not included in this permit. But are included in the Statewide General Permit for Biosolids Management. This information will be used by the Department to develop or update local limits and is also required under 40 CFR 503.

PRETREATMENT

To provide more direct and effective control of pollutants discharged. The Department oversees the delegated Industrial Pretreatment Program to assure compliance with federal pretreatment regulations (40 CFR Part 403) and categorical standards and state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC).

Tacoma has been delegated the authority and responsibility for implementing the federal pretreatment program and state waste discharge permit program for their entire service area, including both of their treatment works and any industries outside of their City limits for which wastewater is accepted by the City. As a prerequisite to accepting loadings from such external jurisdictions, the City must enter into interlocal agreements which allow them to ensure that all requirements of their program are fully implemented in such contributing jurisdictions. While they may not have any known significant industrial users discharging to the Tacoma North plant presently, a key component of the Pretreatment program is finding industries that are potentially subject to the pretreatment program. Another necessary component is monitoring the influent, effluent and biosolids to evaluate whether industrial effects are being observed, and to verify that their program is maintaining its effectiveness.

The City of Tacoma has a pretreatment program to identify commercial and industrial users of the system and prevent those users from discharging to the system without first treating their wastewater. The City of Tacoma's pretreatment program has been identified in the permit for the Central Plant (NPDES Permit No. WA0037087). The pretreatment program was updated in 1994 and delegated through an administrative order to the City to run their own pretreatment program. The Tacoma North End plant shall be covered under this pretreatment program which functions to address the North End and Central Plant service areas.

Because the City of Tacoma has one pretreatment program for both the North End and Central Plants, the monitoring requirements for the pretreatment program apply to the North End plant and is assumed to

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apply to Tacoma's Central Plant under that permit as well. The monitoring for pretreatment shall be an enforceable part of this NPDES permit anytime a commercial or industrial user locates in the North End service area.

REQUIREMENTS FOR PERFORMING AN INDUSTRIAL USER SURVEY

This POTW has the potential to serve significant industrial or commercial users and is required to perform an Industrial User Survey whenever industrial or commercial users are located in the service area. The goal of this survey is to develop a list of SIUs and PSIUs, and of equal importance, to provide sufficient information about industries which discharge to the POTW, to determine which of them require issuance of state waste discharge permits or other regulatory controls. An Industrial User Survey is an important part of the regulatory process used to prevent interference with treatment processes at the POTW and to prevent the exceedance of water quality standards. The Industrial User Survey also can be used to contribute to the maintenance of sludge quality, so that sludge can be a useful biosolids product rather than an expensive waste problem. An Industrial User Survey is a rigorous method for identifying existing, new, and proposed significant industrial users and potential significant industrial users. A complete listing of methodologies is available in the Department guidance document entitled "Conducting an Industrial User Survey."

OUTFALL EVALUATION

Proposed permit condition S.10 requires the Permittee to conduct an outfall inspection once during the five-year permit cycle and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for five years.

REFERENCES FOR TEXT AND APPENDICES

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APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to issue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on July 21, 2002, and July 28, 2002, in the *Tacoma News Tribune* to inform the public that an application had been submitted and to invite comment on the issuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on June 21, 2003, in the *Tacoma News Tribune* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Southwest Regional Office
P.O. Box 47775
Olympia, WA 98504-7775.

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6554, or by writing to the address listed above.

This permit and fact sheet were written by Eric Schlorff.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD₅--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD₅ is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD₅ – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celcius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD₅ is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring --Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

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Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the--State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

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Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at

(<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>)

Calculation of seawater fraction of un-ionized ammonia

from Hampson (1977). Un-ionized ammonia criteria for salt water are from EPA 440/5-88-004.

Based on Lotus File NH3SALT.WK1 Revised 19-Oct-93

INPUT	
1. Temperature (deg C):	13.2
2. pH:	8.1
3. Salinity (g/Kg):	22.4
OUTPUT	
1. Pressure (atm; EPA criteria assumes 1 atm):	1.0
2. Molal Ionic Strength (not valid if >0.85):	0.457
3. pKa8 at 25 deg C (Whitfield model "B"):	9.298
4. Percent of Total Ammonia Present as Unionized:	2.560%
5. Unionized ammonia criteria (mg un-ionized NH3 per liter) From EPA 440/5-88-004	
Acute:	0.233
Chronic:	0.035
6. Total Ammonia Criteria (mg/L as NH3)	
Acute:	9.10
Chronic:	1.37
7. Total Ammonia Criteria (mg/L as NH3-N)	
Acute:	7.48

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Chronic:

1.12

The reasonable potential for ammonia was calculated using marine ambient data from the Department. There is one marine ambient station CMB-003 which is located in central Commencement Bay. Data was available from 1990-2000 and data from all depths was grouped together. The station is located in outer Commencement Bay at 47.2900N 122.4483W. A 90th percentile of ammonium (NH₄) was listed in the form of µM as 3.06 and converted to µg/L using the following formula $3.06 \times 14.01 = 42.87$ mg/L NH₄. The ammonium (NH₄) was converted to ammonia (NH₃) using the Percent of Total Ammonia Present as Unionized from line number four in the table above. Therefore, the ambient ammonia used in the reasonable potential calculation is $42.87 \times 0.02576 = 1.10$ µg/L NH₃.

The other parameters used in the ammonia calculation were derived from the same Department ambient water quality data base. The ambient 90th percentile temperature and pH were used and the 10th percentile salinity were used as shown in the inputs to the above table.

When calculating the reasonable potential for ammonia toxicity, the 95th percentile effluent ammonia value was determined to be 23,530 µg/L based on 148 samples taken from January 2000 to December 2002. The dilution factors were 20 for acute and 52 for chronic (Parametrix 1994). This is the most conservative estimate of dilution factors. The dilution factors for the critical season during critical flow would actually be 45 for acute and 101 for chronic. No exceedance of the ammonia criteria was found and therefore there will be no ammonia limits or limits on any of the metals show below.

Reasonable potential to exceed state water quality standards

U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. Corrected formulas in col G and H on 5/98 (GB)

Parameter	Metal Criteria Translator as decimal	Metal Criteria Translator or as decimal	Metal Criteria Translator or as decimal	State Water Quality Standard		Predicted Max concentration at edge of...		LIMIT REQ'D ?
				Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	
			Ambient Concentration (metals as dissolved) ug/L	ug/L	ug/L	ug/L	ug/L	
Ammonia			1.1090	7460.000	1120.00			
Copper	0.83	0.83	0.6680	0	00	939.36	361.98	NO
Mercury	0.85		0.0003	4.80	3.10	0.98	0.79	NO
Arsenic	1.00		0.9550	1.80	0.0250	0.01	0.00	NO
Lead	0.951	0.95	0.0235	69	36	1.14	1.02	NO
Nickel	0.99	0.99	0.4480	210.00	8.10	0.25	0.11	NO
Silver	0.85		0.0100	74.00	8.20	0.73	0.56	NO
Zinc	0.946	0.946	2.0200	1.90	NA	0.09	0.05	NO
Chromium			0.2120	90.00	81.00	4.63	3.02	NO
Chlorine			0.0000	10300		0.38	0.28	NO
				13	7.50	0.27	0.10	NO

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REASONABLE POTENTIAL CALCULATION INPUTS

Effluent percentile value	<i>P_n</i>	Max effluent conc. measured (metals as total recoverable) <i>ug/L</i>	Coeff Variation <i>CV</i>	<i>s</i>	# of samples <i>n</i>	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor	COMMENTS
0.95	0.980	23530.00	0.60	0.55	148	0.80	20	52	
0.95	0.980	10.53	0.60	0.55	148	0.80	20	52	
0.95	0.762	0.15	0.60	0.55	14	1.54	20	52	1 of 14 values was above detection
0.95	0.807	2.97	0.60	0.55	14	1.54	20	52	
0.95	0.807	3.07	0.60	0.55	14	1.54	20	52	
0.95	0.807	4.00	0.60	0.55	14	1.54	20	52	
0.95	0.807	1.30	0.60	0.55	14	1.54	20	52	1 of 14 values was above detection
0.95	0.807	37.20	0.60	0.55	14	1.54	20	52	
0.95	0.807	2.32	0.60	0.55	14	1.54	20	52	
0.95	0.997	10.00	0.60	0.55	1055	0.54	20	52	

Effluent sampling for Antimony, Berillium Cadmium, Selenium, and Thallium were all below detection and therefore not suspected of causing a problem. Mercury and Silver showed only one value out of 14 samples taken that was above detection and did not show a reasonable potential for violating water quality.

Ambient metals data was taken from two sets of data. Crecelius, in 1998 sampled several stations in outer and inner Commencement Bay. Only the outer three stations that were closest to the discharge were used in the reasonable potential analysis. The data from all three stations (CB1, CB3 and CB4) were combined along with data that was available from an Ecology study (Johnson, 1999) that also used station CB4. The data from both studies were combined and the highest 90th percentile was determined for each metal parameter as shown in the reasonable potential table above. The locations of the Commencement Bay stations are as follows:

CB1 47° 17.4981N 122° 26.2301W
CB3 47° 17.0965N 122° 26.8007W
CB4 47° 16.9523N 122° 26.0544W

Performance Based Limits

Calculated from Daily Fecal Coliform Data from January 2000 through December 2002

DAILY DATA		MONTHLY DATA		WEEKLY DATA	
COUNT =	752	COUNT =	35	COUNT =	153
STDEV =	17.013	STDEV =	7.635	STDEV =	11.051
AVERAGE =	37.294	AVERAGE =	34.881	AVERAGE =	35.685
COV =	0.456	COV =	0.219	COV =	0.310
MAX =	120.00	MAX =	50.73	MAX =	77.06
MIN =	3.70	MIN =	18.48	MIN =	10.11
99th%-tile	100.98	99th%-tile	50.49	99th%-tile	67.10
95th%-tile	72.00	95th%-tile	47.64	95th%-tile	55.60
90th%-tile	55.50	90th%-tile	44.45	90th%-tile	50.06
99th%-tile	92.62	88th%-tile	43.51	88th%-tile	48.48
Num >= 92.62	11	Num >= 47.64	2	Num >= 67.1	2
	1.5%		5.7%		1.3%
		Monthly limit		Weekly limit	
		95th%-tile	47.64	99th%-tile	67.10

These limits are based on EPA guidance for performance-based limits (EPA, 1991). With three years of data it was possible to directly calculate the percentiles for limits rather than rely on statistical methods.

Dissolved oxygen concentration following initial dilution.

References: EPA/600/6-85/002b and EPA/430/9-82-011

Based on Lotus File IDOD2.WK1 Revised 19-Oct-93

INPUT

1. Dilution Factor at Mixing Zone Boundary: 101
2. Ambient Dissolved Oxygen Concentration (mg/L): 6.3

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3. Effluent Dissolved Oxygen Concentration (mg/L): 7.3

4. Effluent Immediate Dissolved Oxygen Demand (mg/L): 0

OUTPUT	
--------	--

Dissolved Oxygen at Mixing Zone Boundary (mg/L):	6.31
--------------------------------------------------	------

Water Quality Standard is 6.0 mg/L

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Acute WET Test Results as NOEC/LOEC in % Effluent

Test #	Sample Date	Test Type	Lab	Organism	Start Date	NOEC	LOEC	MSDp
MPIE004	12/15/1992	Survival (48h)	Ogden	<i>Daphnia pulex</i>	12/15/1992	100	> 100	
MPIE006	12/15/1992	Survival (48h)	Ogden	fathead minnow	12/15/1992	100	> 100	
MPIE002	12/15/1992	Survival (96h)	Ogden	rainbow trout	12/15/1992	100	> 100	22.15%
MPIE015	2/23/1993	Survival (48h)	Ogden	<i>Daphnia pulex</i>	2/24/1993	100	> 100	
MPIE017	2/23/1993	Survival (48h)	Ogden	fathead minnow	2/24/1993	100	> 100	
MPIE013	2/23/1993	Survival (96h)	Ogden	rainbow trout	2/24/1993	< 100	100	21.76%
MPIE021	3/29/1993	Survival (48h)	Ogden	<i>Daphnia pulex</i>	3/30/1993	100	> 100	
MPIE023	3/29/1993	Survival (48h)	Ogden	fathead minnow	3/30/1993	50	100	
MPIE019	3/29/1993	Survival (96h)	Ogden	rainbow trout	3/30/1993	100	> 100	
MPIE032	4/26/1993	Survival (48h)	Ogden	<i>Daphnia pulex</i>	4/27/1993	100	> 100	
MPIE034	4/26/1993	Survival (48h)	Ogden	fathead minnow	4/27/1993	100	> 100	
MPIE030	4/26/1993	Survival (96h)	Ogden	rainbow trout	4/28/1993	100	> 100	16.94%
MPIE040	6/21/1993	Survival (48h)	Ogden	<i>Daphnia pulex</i>	6/22/1993	100	> 100	
MPIE038	6/21/1993	Survival (96h)	Ogden	rainbow trout	6/22/1993	50	100	
MPIE042	6/23/1993	Survival (48h)	Ogden	fathead minnow	6/24/1993	100	> 100	
SSIN563	8/23/93 7:30	Survival	Ogden	<i>Daphnia pulex</i>	8/24/1993	100	> 100	

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		(48h)						
SSIN564	8/23/93 7:30	Survival (48h)	Ogden	fathead minnow	8/24/1993	100	> 100	
SSIN562	8/23/93 7:30	Survival (96h)	Ogden	rainbow trout	8/24/1993	100	> 100	22.75%
KJOH221	10/25/1993	Survival (48h)	Ogden	<i>Daphnia pulex</i>	10/26/1993	100	> 100	
KJOH225	10/25/1993	Survival (48h)	Ogden	fathead minnow	10/26/1993	100	> 100	
KJOH223	10/25/1993	Survival (96h)	Ogden	rainbow trout	10/26/1993	25	50	
KJOH219	1/31/1994	Survival (48h)	Ogden	<i>Daphnia pulex</i>	2/1/1994	100	> 100	
KJOH230	4/18/1994	Survival (48h)	Ogden	fathead minnow	4/19/1994	100	> 100	
KJOH294	7/11/1994	Survival (48h)	Ogden	<i>Daphnia pulex</i>	7/12/1994	100	> 100	12.33%
MPIE052	10/24/1994	Survival (96h)	Ogden	fathead minnow	10/25/1994	100	> 100	
AQTX0089	1/23/1995	Survival (48h)	Ogden	<i>Daphnia pulex</i>	1/24/1995	100	> 100	17.44%
MPIE050	4/17/1995	Survival (96h)	Ogden	fathead minnow	4/18/1995	100	> 100	12.03%
MPIE048	10/16/1995	Survival (96h)	Ogden	fathead minnow	10/17/1995	25	50	
MPIE046	2/21/1996	Survival (48h)	Ogden	<i>Daphnia pulex</i>	2/22/1996	100	> 100	11.71%
MPIE054	5/13/1996	Survival (96h)	Ogden	fathead minnow	5/14/1996	50	100	
MPIE056	8/12/1996	Survival (48h)	Ogden	<i>Daphnia pulex</i>	8/13/1996	100	> 100	8.72%
MPIE058	10/21/1996	Survival (96h)	Ogden	fathead minnow	10/22/1996	25	50	
MPIE060	1/28/1997	Survival (48h)	Ogden	<i>Daphnia pulex</i>	1/29/1997	100	> 100	

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MPIE062	4/8/1997	Survival (48h)	Ogden	<i>Daphnia pulex</i>	4/8/1997	100	> 100	18.95%
MPIE064	7/9/1997	Survival (96h)	Ogden	fathead minnow	7/9/1997	50	100	
MPIE066	10/20/1997	Survival (96h)	Ogden	fathead minnow	10/21/1997	100	> 100	
MPIE068	1/12/1998	Survival (48h)	Ogden	<i>Daphnia pulex</i>	1/13/1998	100	> 100	12.69%
MPIE070	5/7/1998	Survival (96h)	Ogden	fathead minnow	5/8/1998	100	> 100	
MPIE072	7/13/1998	Survival (48h)	Ogden	<i>Daphnia pulex</i>	7/14/1998	100	> 100	18.94%
MPIE074	10/12/1998	Survival (96h)	Ogden	fathead minnow	10/13/1998	100	> 100	
MPIE076	1/25/1999	Survival (48h)	AMEC	<i>Daphnia pulex</i>	1/25/1999	100	> 100	
MPIE078	4/12/1999	Survival (96h)	AMEC	fathead minnow	4/12/1999	50	100	28.24%
MPIE080	7/19/1999	Survival (48h)	AMEC	<i>Daphnia pulex</i>	7/19/1999	100	> 100	8.28%
AQTX002868	10/25/99 6:00	Survival (96h)	AMEC	fathead minnow	10/25/99 13:15	100	> 100	17.98%
AQTX002870	1/10/00 6:00	Survival (48h)	AMEC	<i>Daphnia pulex</i>	1/11/00 13:10	100	> 100	
AQTX002872	4/17/00 6:00	Survival (96h)	AMEC	fathead minnow	4/18/00 14:00	100	> 100	7.91%
AQTX002312	7/17/00 6:00	Survival (48h)	AMEC	<i>Daphnia pulex</i>	7/17/00 13:50	100	> 100	
AQTX002874	10/23/00 6:00	Survival (96h)	AMEC	fathead minnow	10/24/00 14:00	100	> 100	5.59%
AQTX002876	1/22/01 6:00	Survival (48h)	AMEC	<i>Daphnia pulex</i>	1/23/01 14:00	100	> 100	24.44%
AQTX002878	4/16/01 6:00	Survival (96h)	AMEC	fathead minnow	4/16/01 14:00	50	100	19.73%
AQTX002880	7/16/01 6:00	Survival	AMEC	<i>Daphnia pulex</i>	7/17/01 10:45	100	> 100	11.71%

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		(48h)						
AQTX002882	10/15/01 6:00	Survival (96h)	AMEC	fathead minnow	10/15/01 13:30	25	50	13.62%
AQTX002884	1/8/02 6:00	Survival (48h)	AMEC	<i>Daphnia pulex</i>	1/8/02 19:45	100	> 100	12.33%
AQTX003060	4/3/02 6:00	Survival (96h)	AMEC	fathead minnow	4/3/02 13:30	100	> 100	7.46%
AQTX003262	7/8/2002 6:00	Survival (48h)	AMEC	<i>Daphnia pulex</i>	7/8/2002 13:30	100	> 100	10.77%
AQTX003264	10/9/2002 6:00	Survival (96h)	AMEC	fathead minnow	10/9/2002 14:15	25	50	
AQTX003266	1/8/2003 6:00	Survival (48h)	AMEC	<i>Daphnia pulex</i>	1/8/2003 14:10	100	> 100	

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Acute WET Test Results as % Survival in 100% Effluent

Test #	Sample Date	Lab	Start Date	Test Type	Organism	% Survival
MPIE004	12/15/1992	Ogden	12/15/1992	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE006	12/15/1992	Ogden	12/15/1992	Survival (48h)	fathead minnow	85.0%
MPIE002	12/15/1992	Ogden	12/15/1992	Survival (96h)	rainbow trout	90.0%
MPIE015	2/23/1993	Ogden	2/24/1993	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE017	2/23/1993	Ogden	2/24/1993	Survival (48h)	fathead minnow	75.0%
MPIE013	2/23/1993	Ogden	2/24/1993	Survival (96h)	rainbow trout	40.0%
MPIE021	3/29/1993	Ogden	3/30/1993	Survival (48h)	<i>Daphnia pulex</i>	90.0%
MPIE023	3/29/1993	Ogden	3/30/1993	Survival (48h)	fathead minnow	75.0%
MPIE019	3/29/1993	Ogden	3/30/1993	Survival (96h)	rainbow trout	100.0%
MPIE032	4/26/1993	Ogden	4/27/1993	Survival (48h)	<i>Daphnia pulex</i>	95.0%
MPIE034	4/26/1993	Ogden	4/27/1993	Survival (48h)	fathead minnow	95.0%
MPIE030	4/26/1993	Ogden	4/28/1993	Survival (96h)	rainbow trout	96.7%
MPIE040	6/21/1993	Ogden	6/22/1993	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE038	6/21/1993	Ogden	6/22/1993	Survival (96h)	rainbow trout	3.3%
MPIE042	6/23/1993	Ogden	6/24/1993	Survival (48h)	fathead minnow	95.0%
SSIN563	8/23/93 7:30	Ogden	8/24/1993	Survival (48h)	<i>Daphnia pulex</i>	90.0%
SSIN564	8/23/93 7:30	Ogden	8/24/1993	Survival (48h)	fathead minnow	100.0%
SSIN562	8/23/93 7:30	Ogden	8/24/1993	Survival (96h)	rainbow trout	90.0%
KJOH221	10/25/1993	Ogden	10/26/1993	Survival (48h)	<i>Daphnia pulex</i>	95.0%
KJOH225	10/25/1993	Ogden	10/26/1993	Survival (48h)	fathead minnow	100.0%
KJOH223	10/25/1993	Ogden	10/26/1993	Survival (96h)	rainbow trout	0.0%
KJOH219	1/31/1994	Ogden	2/1/1994	Survival (48h)	<i>Daphnia pulex</i>	95.0%
KJOH230	4/18/1994	Ogden	4/19/1994	Survival	fathead	80.0%

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				(48h)	minnow	
KJOH294	7/11/1994	Ogden	7/12/1994	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE052	10/24/1994	Ogden	10/25/1994	Survival (96h)	fathead minnow	80.0%
AQTX0089	1/23/1995	Ogden	1/24/1995	Survival (48h)	<i>Daphnia pulex</i>	95.0%
MPIE050	4/17/1995	Ogden	4/18/1995	Survival (96h)	fathead minnow	95.0%
MPIE048	10/16/1995	Ogden	10/17/1995	Survival (96h)	fathead minnow	75.0%
MPIE046	2/21/1996	Ogden	2/22/1996	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE054	5/13/1996	Ogden	5/14/1996	Survival (96h)	fathead minnow	0.0%
MPIE056	8/12/1996	Ogden	8/13/1996	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE058	10/21/1996	Ogden	10/22/1996	Survival (96h)	fathead minnow	30.0%
MPIE060	1/28/1997	Ogden	1/29/1997	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE062	4/8/1997	Ogden	4/8/1997	Survival (48h)	<i>Daphnia pulex</i>	95.0%
MPIE064	7/9/1997	Ogden	7/9/1997	Survival (96h)	fathead minnow	0.0%
MPIE066	10/20/1997	Ogden	10/21/1997	Survival (96h)	fathead minnow	95.0%
MPIE068	1/12/1998	Ogden	1/13/1998	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE070	5/7/1998	Ogden	5/8/1998	Survival (96h)	fathead minnow	100.0%
MPIE072	7/13/1998	Ogden	7/14/1998	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE074	10/12/1998	Ogden	10/13/1998	Survival (96h)	fathead minnow	100.0%
MPIE076	1/25/1999	AMEC	1/25/1999	Survival (48h)	<i>Daphnia pulex</i>	100.0%
MPIE078	4/12/1999	AMEC	4/12/1999	Survival (96h)	fathead minnow	36.7%
MPIE080	7/19/1999	AMEC	7/19/1999	Survival (48h)	<i>Daphnia pulex</i>	100.0%
AQTX002868	10/25/99 6:00	AMEC	10/25/99 13:15	Survival (96h)	fathead minnow	93.3%
AQTX002870	1/10/00 6:00	AMEC	1/11/00 13:10	Survival (48h)	<i>Daphnia pulex</i>	100.0%
AQTX002872	4/17/00 6:00	AMEC	4/18/00 14:00	Survival (96h)	fathead minnow	100.0%
AQTX002312	7/17/00 6:00	AMEC	7/17/00 13:50	Survival (48h)	<i>Daphnia pulex</i>	100.0%

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AQTX00287 4	10/23/00 6:00	AMEC	10/24/00 14:00	Survival (96h)	fathead minnow	96.7%
AQTX00287 6	1/22/01 6:00	AMEC	1/23/01 14:00	Survival (48h)	<i>Daphnia pulex</i>	90.0%
AQTX00287 8	4/16/01 6:00	AMEC	4/16/01 14:00	Survival (96h)	fathead minnow	66.7%
AQTX00288 0	7/16/01 6:00	AMEC	7/17/01 10:45	Survival (48h)	<i>Daphnia pulex</i>	100.0%
AQTX00288 2	10/15/01 6:00	AMEC	10/15/01 13:30	Survival (96h)	fathead minnow	0.0%
AQTX00288 4	1/8/02 6:00	AMEC	1/8/02 19:45	Survival (48h)	<i>Daphnia pulex</i>	100.0%
AQTX00306 0	4/3/02 6:00	AMEC	4/3/02 13:30	Survival (96h)	fathead minnow	93.3%
AQTX00326 2	7/8/2002 6:00	AMEC	7/8/2002 13:30	Survival (48h)	<i>Daphnia pulex</i>	95.0%
AQTX00326 4	10/9/2002 6:00	AMEC	10/9/2002 14:15	Survival (96h)	fathead minnow	0.0%
AQTX00326 6	1/8/2003 6:00	AMEC	1/8/2003 14:10	Survival (48h)	<i>Daphnia pulex</i>	100.0%

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Chronic WET Test Results as NOEC/LOEC in % Effluent

Test #	Sample Date	Lab	Organism	Start Date	Endpoint	NOEC	LOEC	MSDp
MPIE008	12/15/1992	Ogden	<i>Ceriodaphnia dubia</i>	12/15/1992	7-day Survival	100	> 100	
					Reproduction	25	50	24.76%
MPIE010	12/15/1992	Ogden	fathead minnow	12/15/1992	7-day Survival	100	> 100	8.28%
					Biomass	100	> 100	25.06%
					Weight	100	> 100	27.51%
MPIE011	12/15/1992	Ogden	<i>Selenastrum</i>	12/15/1992	Cell Density	100	> 100	42.80%
MPIE025	3/29/1993	Ogden	<i>Ceriodaphnia dubia</i>	3/30/1993	7-day Survival	100	> 100	
					Reproduction	25	50	46.25%
MPIE027	3/29/1993	Ogden	fathead minnow	3/30/1993	7-day Survival	100	> 100	15.53%
					Biomass	50	100	31.24%
					Weight	12.5	25	32.86%
MPIE028	3/29/1993	Ogden	<i>Selenastrum</i>	3/30/1993	Cell Density	12.5	25	35.48%
SSIN578	6/21/93 7:30	Ogden	<i>Selenastrum</i>	6/22/1993	Cell Density	50	100	57.37%
MPIE044	7/12/1993	Ogden	<i>Ceriodaphnia dubia</i>	7/13/1993	7-day Survival	50	100	
					Reproduction	50	100	64.02%
SSIN577	7/12/93 7:30	Ogden	fathead minnow	7/13/1993	7-day Survival	100	> 100	21.06%
					Biomass	100	> 100	19.92%
					Weight	100	> 100	27.11%
SSIN565	8/23/93 7:30	Ogden	<i>Ceriodaphnia dubia</i>	8/24/1993	7-day Survival	100	> 100	
					Reproduction	6.25	12.5	30.50%
SSIN566	8/23/93 7:30	Ogden	fathead minnow	8/24/1993	7-day Survival	100	> 100	14.51%

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					Biomass	100	> 100	27.71%
					Weight	100	> 100	27.55%
SSIN567	8/25/93 7:30	Ogden	<i>Selenastrum</i>	8/26/1993	Cell Density	25	50	35.84%

Human Health Reasonable Potential Calculation

Parameter	Ambient Concentration (Geometric Mean) ug/L	Water Quality Criteria for Protection of Human Health ug/L	Max concentration at edge of chronic mixing zone. ug/L	LIMIT REQ'D?	Expected Number of Compliance Samples per Month	AVERAGE MONTHLY EFFLUENT LIMIT ug/L	MAXIMUM DAILY EFFLUENT LIMIT ug/L
antimony	0.00	4300.00		NO		NONE	NONE
bis(e-ethylexyl)phthalate	0.0000	5.90	0.57	NO		NONE	NONE
diethylphthalate	0.0000	120000	0.20	NO		NONE	NONE
chloroform	0.0000	470.00	0.00	NO		NONE	NONE
nickel	0.0000	4600.00	0.03	NO		NONE	NONE
thallium	0.0000	6.30	0.04	NO		NONE	NONE
mercury	0.0000	0.15	0.00	NO		NONE	NONE

Human Health Calculations

Estimated
Percentile
at 95%

of
samples
from

Calculated
50th
percentile

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Confidence		Max effluent conc. measured	Coeff Variation		which # in col. J was taken	Multiplier	Effluent Conc. (When n>10)	Dilution Factor
	<i>Pn</i>	<i>ug/L</i>	<i>CV</i>	<i>S</i>	<i>n</i>			
0.50	0.61	2.48	0.60	0.6	6	0.86		52.0
0.50	0.05	12.00	0.60	0.6	1	2.49		52.0
0.50	0.05	4.10	0.60	0.6	1	2.49		52.0
0.50	0.05		0.60	0.6	1	2.49		52.0
0.50	0.81	4.00	0.60	0.6	14	0.62	1.50	52.0
0.50	0.81	7.21	0.60	0.6	14	0.62	2.10	52.0
0.50	0.81	0.15	0.60	0.6	14	0.62	0.10	52.0

The dilution factor used was more stringent than necessary. Dilution factors should be 45 acute, 101 chronic. No potential was found with the more stringent and conservative dilution factors.

Chlorine Residual Water Quality-Based Permit Limits for acute and chronic criteria.

(based on EPA/505/2-90-001 Box 5-2).

Based on Lotus File WQBP2.WK1 Revised 19-Oct-93

INPUT

- | | |
|------------------------------------------------------------------------------------------------|---------|
| 1. Water Quality Standards (Concentration) | |
| Acute (one-hour) Criteria for chlorine: | 13.000 |
| Chronic (n-day) Criteria for chlorine: | 7.500 |
| 2. Upstream Receiving Water Concentration | |
| Upstream Concentration for Acute Condition (7Q10): | 0.000 |
| Upstream Concentration for Chronic Condition (7Q10): | 0.000 |
| 3. Dilution Factors (1/{Effluent Volume Fraction}) | |
| Acute Receiving Water Dilution Factor at 7Q10: | 45.000 |
| Chronic Receiving Water Dilution Factor at 7Q10: | 101.000 |
| 4. Coefficient of Variation for Effluent Concentration
(use 0.6 if data are not available): | 0.460 |
| 5. Number of days (n1) for chronic average
(usually four or seven; four is recommended): | 7 |
| 6. Number of samples (n2) required per month for monitoring: | 30 |

OUTPUT

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1. Z Statistics

LTA Derivation (99%tile):	2.326
Daily Maximum Permit Limit (99%tile):	2.326
Monthly Average Permit Limit (95%tile):	1.645

2. Calculated Waste Load Allocations (WLA's)

Acute (one-hour) WLA:	585.000
Chronic (n1-day) WLA:	757.000

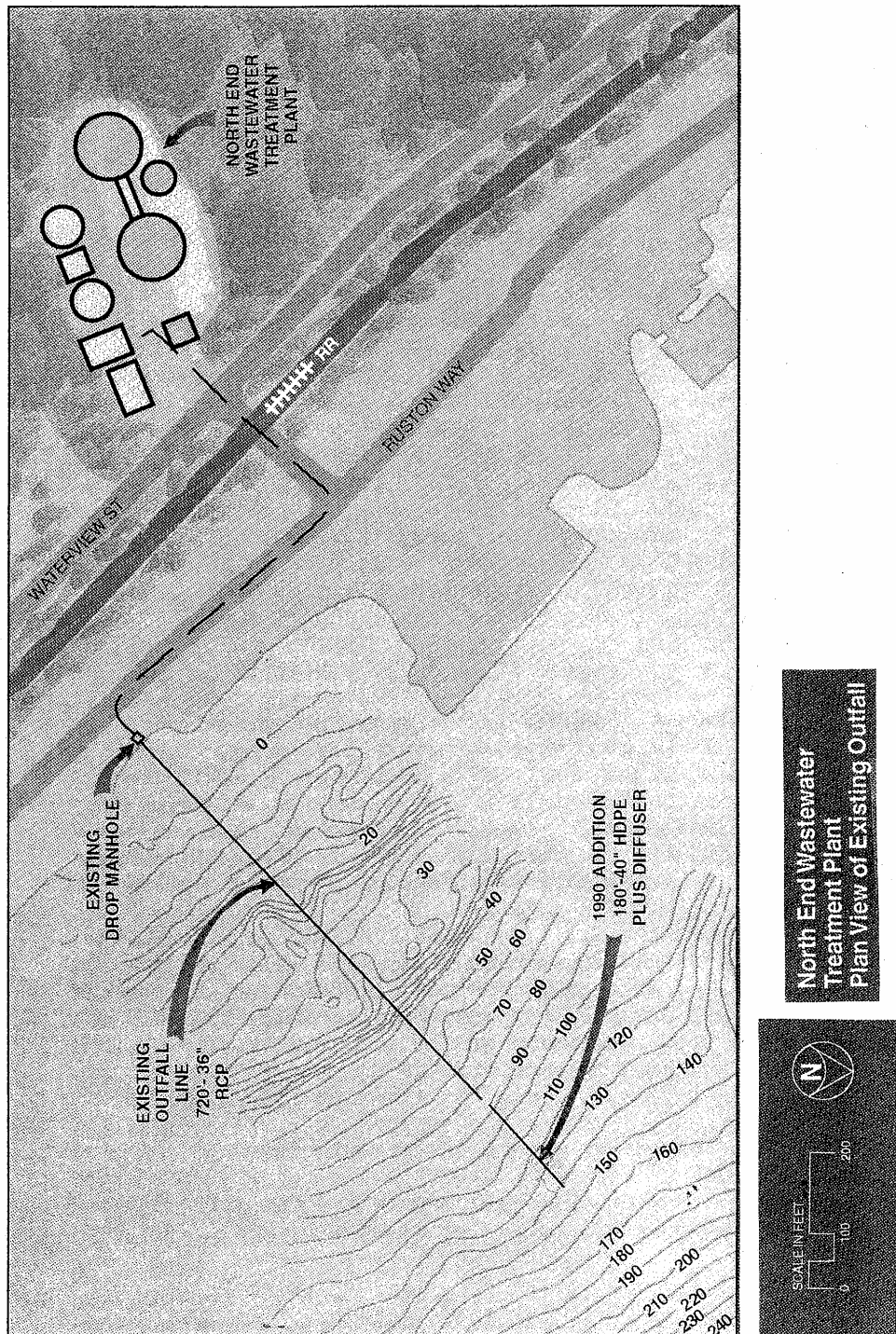
3. Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3)

Sigma^2:	0.3075
Sigma^2-n1:	0.00501
LTA for Acute (1-hour) WLA:	187.834
LTA for Chronic (n1-day) WLA:	461.355
Most Limiting LTA (minimum of acute and chronic):	187.834

4. Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4)

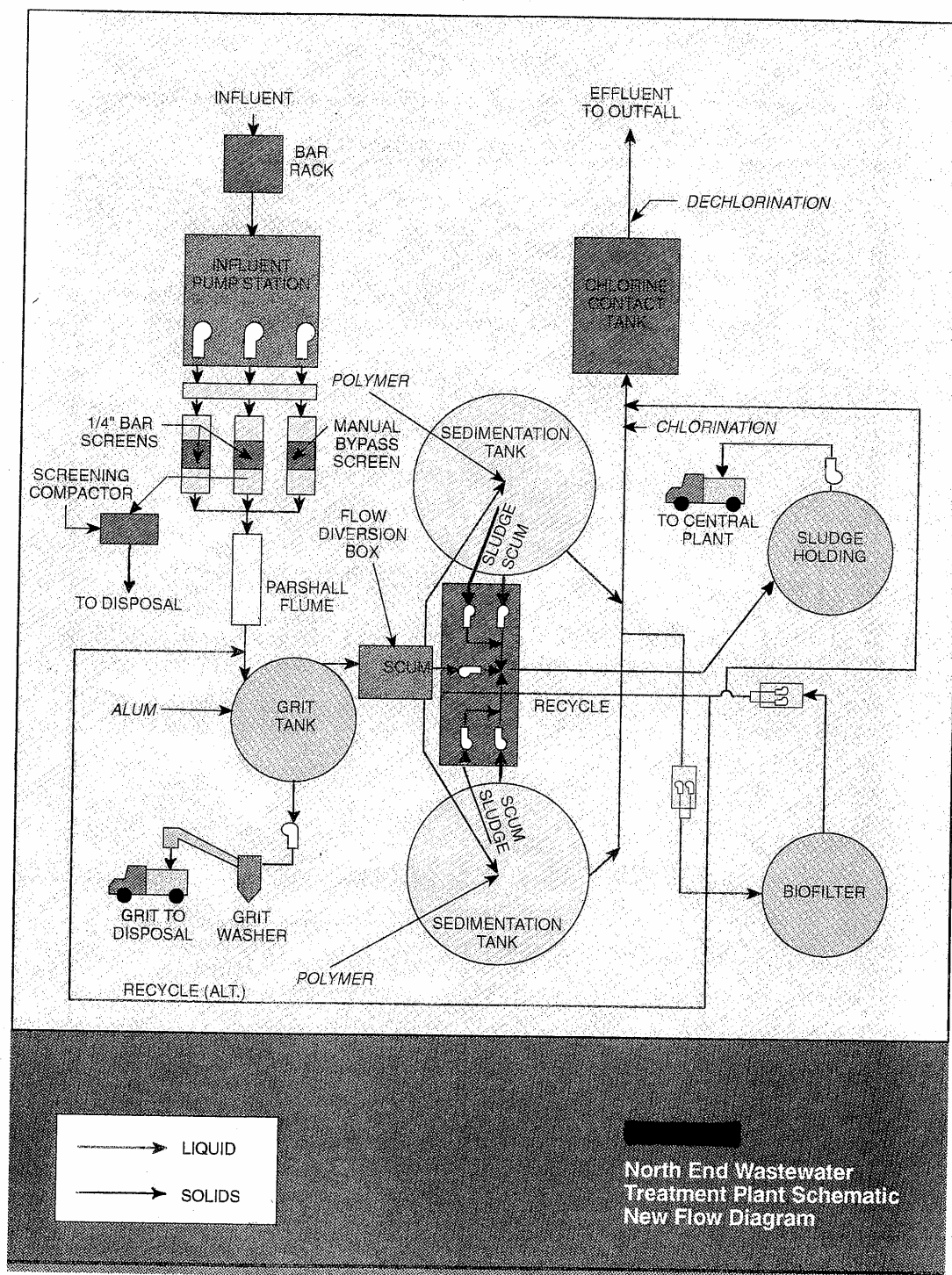
Sigma^2-n2:	0.0119
Daily Maximum Permit Limit:	585.000
Monthly Average Permit Limit:	223.465

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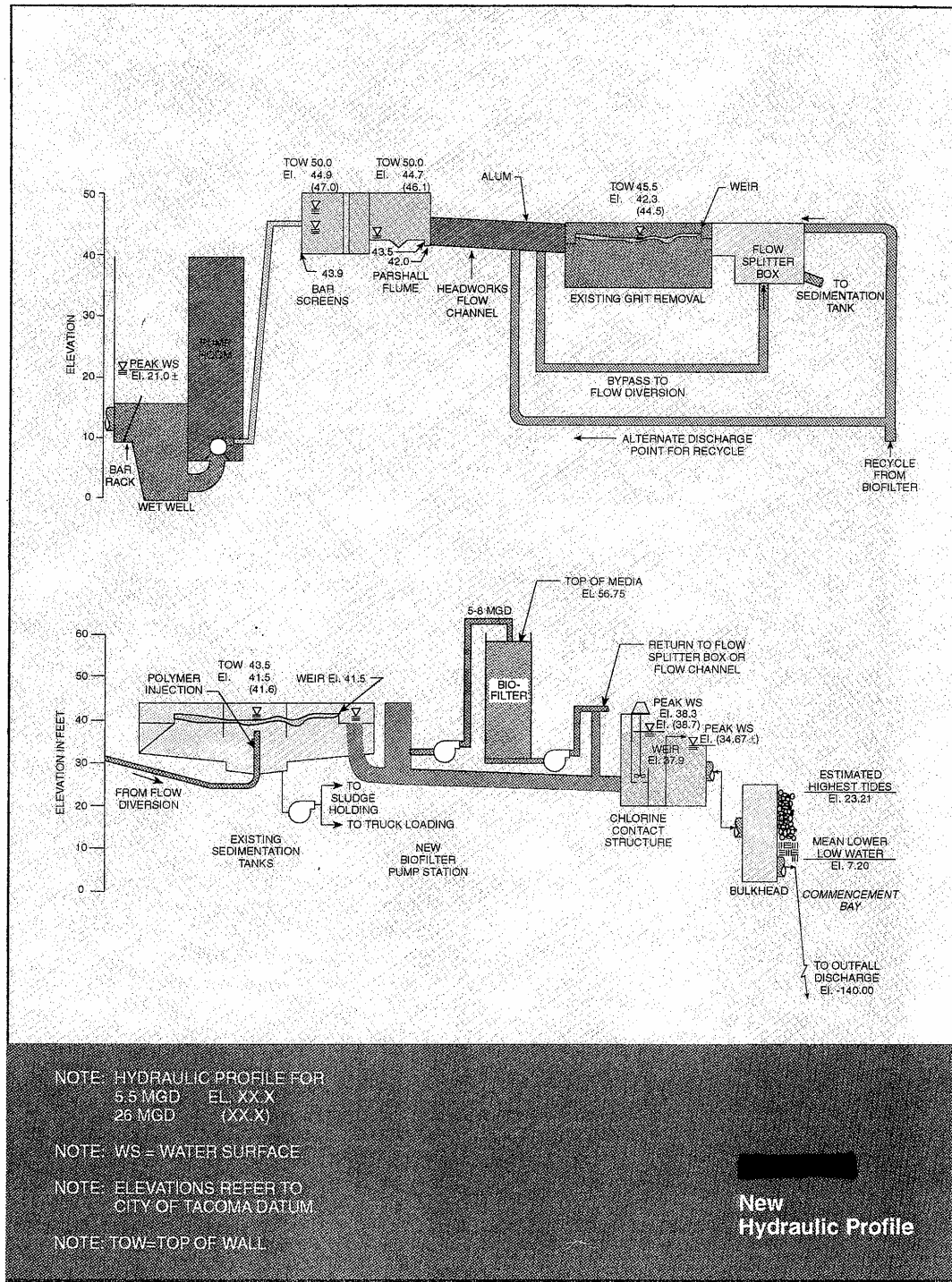
From Parametrix, 1994

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From Parametrix, 1994

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From Parametrix 1994

APPENDIX D--RESPONSE TO COMMENTS

All of the following comments were from the City of Tacoma and received by the Department on July 21, 2003.

We appreciate that Ecology has made a number of correction and revisions to the draft NPDES permit for Tacoma's North End Treatment Plant. There are still several serious errors of fact and conclusions with the draft NETP NPDES permit.

Comment 1:

The draft NPDES permit proposes to drastically reduce limits for fecal coliform for the North End Plant on the assumption that the receiving waters are impaired due to high Fecal coliform. This assumption is based on data collected outside the Water Resource Inventory Area (WRIA) that contains the NETP. The Commencement Bay 303d listing for Fecal coliform is in WRIA #10 (Puyallup/White River) on the North (Browns Point area) part of the Bay (WRIA maps attached). The NETP outfall is in WRIA #12 (Chambers/Clover). The accompanying Fact sheet indicates that the ambient fecal coliform level in the receiving water is 75 org/100 ml. Ecology obtained this data from a monitoring station north and east of the NETP outfall. Existing data collected for the 1987 facilities plan found Fecal coliform in the vicinity of the NETP outfall of 10 org/100 ml (less than the water quality standard of 14 org/ 100 ml). Ecology's Permit Writers Manual Chapter VI section 3.3.11 states that a water body listed on the 303d list is not a presumption of impairment unless the listed section is the point of discharge. As the fact sheet indicates, Ecology's ambient monitoring data is not taken at the point of discharge of the NETP. Ecology has no basis for presuming water quality impairment and therefore cannot impose performance-based limits.

Response 1:

The 303(d) list shows outer Commencement Bay listed. It does list a different WRIA (10) than the location of the treatment plant (12), however, the WRIA apply best to upland watersheds and Commencement Bay receives water from both of these watersheds where it is commingled. Based on the information available the Department believes the receiving water at the point of discharge is likely to have high fecal coliform above the marine criteria. The performance based limit is established using EPA guidance and is recommended in the permit writers' manual. The daily limit is close to the 99th percentile and the monthly limit is lower but is based on monthly sampling. It is the Department's view that these limits will not be exceeded if the Permittee optimizes their chlorine dose. The Department has recalculated weekly and monthly limits using the 99th percentile to reduce the number of violations and has used a weekly limit instead of a daily limit. The Department feels this approach would be less restrictive.

Comment 2:

Even if it is assumed that the receiving waters of the NETP are impaired the Permit Writers Manual states that "A point source discharging to a water body with multiple sources of impairment, that is a minor source of impairment and may gain relief from a TMDL, is not required to have a final limitation as the numeric water quality criteria before a TMDL is completed." The facility plan states; "In a study that examined the effect of effluent from the North End Treatment Plant on coliform bacteria densities in waters surrounding the outfall, it was found that the contribution of these bacteria by the North End treatment plant was minimal and

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bacteria densities in Commencement Bay increased, not with greater proximity to the Wastewater Treatment Plant (WWTP) outfall but with greater proximity to the Port of Tacoma. The conclusion drawn is that the contribution of coliform bacteria by the Puyallup River is many times greater than that of the North End WWTP.” The NETP is clearly a minor source of impairment (if a source of impairment at all) and a water quality (or performance based) limit is not required.

Response 2:

The Department does not view the discharge to a 303(d) listed water body as a necessarily small discharge. The data from 1983 provided by the Permittee does not accurately represent present conditions in the vicinity of the outfall. The data is 20 years old and was sampled exclusively in August. The Department data from the Browns Point station was taken during the last ten years every month of the year. The data shows that fecal coliform values are elevated in the winter months. Even though the Puyallup does tend to circulate to the northeast, there is likely influence on the area around the outfall. The performance based limit will remain.

Comment 3:

Ecology is proposing to set fecal coliform limits based on the past superior performance of the NETP that are calculated to produce a 5 percent failure rate (at a potential fine of \$10,000 per occurrence). In essence, Ecology is proposing to punish the City of Tacoma for overzealous protection of Commencement Bay. Such a drastic change in permit requirements needs careful consideration and should be based on reliable data collected in the receiving water of the NETP. If such data does not currently exist (we believe the data collected for the 1987 facility plan is still relevant) then this data should be collected prior to imposing a new more stringent requirement in the new permit. The Water Quality Permit Writers Manual states "Requirements for imposing effluent limitations for the protection of water quality requires a determination of reasonable potential determined by a rational scientific process. Ecology's Permit Writers manual also states (Chapter VI) that the purposes of performance based limits is to prevent additional pollution in the receiving water until additional studies can be conducted in the furtherance of a TMDL or WLA. It is not contemplated as an instrument to reduce discharges but rather as a way to maintain the status quo. It is grossly unjustified to impose more stringent effluent limitations based upon data where the nexus to the area of our outfall and influence from our outfall is highly questionable. We strongly urge Ecology to retain the technology based fecal coliform limits contained in the current permit to allow time to conduct the studies necessary to justify such a drastic change in permit limits and a drastic increase in exposure to violations because of the statistical prediction that we would violate this new standard 5 percent of the time.

Response 3:

The performance based limit is established using EPA methodologies and is recommended in the permit writers' manual. A 99th percentile has been used instead of the 95th percentile. It is the Department's view that these limits will not be exceeded if the Permittee optimizes their chlorine dose--which Tacoma has demonstrated it has the technology in-place to do effectively. The Permittee is free to conduct a receiving water study to demonstrate that the receiving water is not impaired at the point of discharge if they feel this is the case. However, the Department is not mandating such a study. If conducted, such a study should include wet season data as well as dry and sampling at different points in the tidal cycle. Background conditions are an important part of determining if a discharge is going to have an impact on water quality standards. If the background is above water quality standards then it is the Department's policy to limit the discharge to existing levels until a TMDL has been conducted. The technology limits

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of 200, 400 col/100ml are therefore inappropriate in this case. Again, based on the available data the Department believes that the receiving water at the point of discharge is impaired and will keep the performance based limit in-place.

Comment 4:

You indicated that to reduce the potential of violating 5 percent of the time we should just add more chlorine. We find that very interesting. For years Ecology has been advocating that chlorine is toxic and we should take all reasonable steps to reduce (not increase) its usage to that maximum extent possible in the disinfection processes at municipal treatment plants. But if we did increase our usage to achieve no violations, in the subsequent permit cycle assuming performance based permitting continues, we would get a new limit of even lower coliform limitations since with added chlorine we would further reduce the coliform counts. At that time the new lower limit would, once again, result in 5 percent failure rate and we would have to add even more chlorine. This logic is fatally flawed and bad for the environment.

Response 4:

The Department *believes* the Permittee will *be able to meet* the lower fecal coliform levels *by optimizing* the chlorine *dosing*. This does not necessarily require the use of more chlorine. Achieving a reduction in pathogens in marine water is just as important as limiting chlorine toxicity. However, we know that toxicity limits will not be exceeded if the city takes care to control the dosing.

Comment 5:

The Performance Based Limits for fecal coliform are incorrectly calculated. Ecology has calculated the monthly and weekly fecal coliform limits using average monthly and average weekly data. EPA's Technical Support Document for calculating NPDES Permit Limits (EPA 1991) Appendix E state that Monthly average data are to be based on the average daily values. In addition the TSD recognizes that daily pollutant discharges are log normally distributed. Ecology failed to transform the data to account for this non- normal distribution. Ecology's permit writer's manual states that the monthly limit should be calculated as 2 standard deviations from the mean of the log normally transformed data. The weekly limit is calculated as 3 standard deviations from the log normally transformed mean. The monthly limit based on Ecology and EPA methods should have been:

Ecology Method (Water Quality Program Permit Writer's Manual Pub: 92-109)

Monthly Limit = $\text{EXP}[\text{Mean}(\ln(x)) + 2(\text{Standard Deviation}(\ln(x)))]$

$\text{EXP}[3.65 + 2(.394)] = \mathbf{84.84}$

Weekly Limit = $\text{EXP}[\text{Mean}(\ln(x)) + 3(\text{Standard Deviation}(\ln(x)))]$

$\text{EXP}[3.65 + 3(.394)] = \mathbf{125.83}$

Response 5:

The methods we used are legitimate. If enough data is available -- and Tacoma certainly has enough data-- a 95th and 99th percentile can be directly calculated (TSD page E1, 2nd paragraph). The methods you are proposing are usually used where enough data is not available.

Comment 6:

The monthly effluent mass loading limit for TSS has been incorrectly calculated. As cited by Ecology on page 9 of the fact sheet, the monthly effluent mass loadings are calculated from the monthly influent design loadings presented in Table 4.4 of the 1994 Engineering report prepared by Parametrix. The actual design loading for TSS is **11,366 lbs/day** not 8,882 lbs/day. The TSS monthly mass loading should be:

$$11,366 \times 0.15 = \mathbf{1,705 \text{ lbs/day}}$$

The weekly average effluent mass loading for TSS should be:

$$1.5 \times 1,705 = \mathbf{2,557 \text{ lbs/day}}$$

Response 6:

We will accept this change to the loading limits for TSS.

Comment 7:

The imposition of Acute WET limits has caused us to re-examine our WET testing data. Our WET failures over previous years are almost all due to slightly elevated levels of ammonia. It appears that this elevated ammonia level may be due to pH drift at the laboratory, a phenomena that does not occur in nature. We suggest that Ecology refrain from issuing an acute WET limit and allow us to continue monitoring without a limit. If this is not possible there should be some expressed provision for the City to demonstrate that an Acute WET limit is not needed and to remove it from the permit. Whole effluent toxicity testing has been shown to be unreliable. False positives occur at an alarming rate (33 percent). Ecology needs to be cautious in interpreting WET results.

Response 7:

The WET limit *is* needed. The WET language allows for retesting and specifies lab procedures. The only way to be free of the WET limit is to test cleanly with the limit in place. The Department has developed and implemented a WET test review program designed to control false positive WET test results and reveal laboratory inadequacies. This approach has gained acceptance in both the U.S. and Canada. Groups suing EPA have referenced the Department WET test review system as a good approach for resolving problems. For more information, see:

WA WET webpage: <http://www.ecy.wa.gov/programs/wq/wet>

Risk Sciences site for permittees with WET: <http://www.toxicity.com/pdf/toxblank.pdf>,

<http://www.toxicity.com/pdf/epa2000june.pdf>, <http://www.toxicity.com/pdf/epa2000july.pdf>

Environment Canada Guidance Document on Application and Interpretation of Single-species Tests in Environmental Toxicology. EPS 1/RM/34E. <http://www.ec.gc.ca/publications/defaultE.cfm>

Specific Comments:

S1 – Discharge Limitations:

Comment 8:

Ecology has calculated the weekly average lbs/day of TSS and BOD erroneously. The calculation is:

$$11,366 \times 0.15 = \mathbf{1,705 \text{ lbs/day}}$$

The weekly average effluent mass loading for TSS should be:

$$1.5 \times 1,705 = \mathbf{2,557 \text{ lbs/day}}$$

Response 8:

The Department accepts this change.

Comment 9:

There is no legal authority to set limits so as to fail at least 5 percent of the time by design. Limits need to be based on AKART [173-220-130(a), 173-221-020]. This means they must reflect reasonable methods of treatment. A requirement that cannot be achieved does not reflect such reasonable treatment requirements. If intended to express 173-221-030(11) as a concept, make sure it's correctly calculated. Fecal coliform limit should be AKART: 200-col/100ml monthly and 400 col/100 ml weekly.

Response 9:

The policy for using a 95th percentile for a performance based limit is clearly part of EPA's TSD and the Department's permit writers manual. However, we have chosen to use the 99th percentile to eliminate as many violations as possible. The Department does not think the Permittee will have any trouble meeting the lower fecal coliform levels after *optimizing* the chlorine *dosing*.

Comment 10:

Ecology states in the fact sheet that chlorine residual did not show a reasonable potential for violating standards. Therefore there is no justification for imposing a new limit.

Response 10:

State law directs Ecology to incorporate permit conditions to reduce toxicants in wastewater regardless of receiving water quality or the minimum water quality standards. Since *the Permittee may seek to increase chlorine dosing in order to meet the new fecal coliform limit, the chlorine limit is warranted*. The chlorine limit will remain.

Comment 11:

Daily limits should be on a 24 hr day instead of a calendar day.

Response 11:

This item was already changed prior to the public review draft in S1.A. footnote "d."

S2 - Monitoring Requirements:

Comment 12:

Influent pH should be a grab rather than continuous. In stream pH monitors tend to blind.

Response 12:

This item was already changed to “grab” prior to the public review draft in S1.A.

Comment 13:

Effluent chlorine samples should be grab samples to be consistent with fecal sampling.

Response 13:

This item was already changed to “grab” prior to the public review draft in S1.A.

Comment 14:

The NETP has no SIUs so quarterly sampling for priority pollutants is unnecessary. Change to yearly sampling.

Response 14:

Quarterly sampling is appropriate for a POTW of this size with a delegated pretreatment program; and is not directly related to the number or type of known Significant Industrial Users.

S3 – Reporting:

Comment 15:

DMRs should be due to Ecology on the 20th of the month to allow time for lab analysis.

Response 15:

Reporting by the 15th is a deadline that other permittees are routinely able to meet. This reasonable requirement will remain in the permit.

Comment 16:

Non-Compliance notification: detailed report due in 5 business days.

Response 16:

It is reasonable to require non-compliance notification within 5 days of the non-compliance given the fact that the NETP operates seven days a week.

Comment 17:

Page 9 of 36 - The criteria to report Priority Pollutant analysis data within 45 days in some cases could be difficult. A lot of data has to be processed in addition to normal workloads. Ecology's own lab often takes much longer to report data of similar nature. We would like a minimum of 60 days with no penalty for later reporting.

Response 17:

Labs meet these timelines routinely for other dischargers. The timeline is met by other dischargers and will remain in the permit.

S4 – Facility Loading:

Comment 18:

NETP service area is built out. Ecology is already aware that our plan is to reduce I&I but no additional facilities are warranted.

Response 18:

The design limits for permits are covered under WAC 173-220-150. The design criteria for flow is an important part of every permit *and assures that facilities are adequate to treat the wastestream*. Even though the service area is built out, there is concern that storm flows, I/I, and housing density increases can at any time put the system over *its ability to adequately treat the flows*. The City is dealing with an aging collection system. These design criteria are what the plant is rated for and will remain in the permit unless an engineering *report, including a re-rate*, shows that the plant can handle a higher loading.

Comment 19:

TSS loading for maximum month = 11,366 lbs/day

Response 19:

This change will be made to the permit.

Comment 20:

We question whether the planning requirement should kick in when the waste load reaches 85 percent of the design criteria for each and every one of the design criteria. Before the planning requirement kicks in, there ought to be a reasonable potential for a violation of an effluent limit and/or an expectation that we would reach the 100 percent design limit within the permit term.

Response 20:

It is reasonable to require a facility to start its planning when waste loads reach 85 percent of design criteria rather than waiting until a facility reaches 100 percent of design criteria.

Comment 21:

Planning elements in S4.B.2 should be examples, not mandatory requirements. With this planning requirement and other planning requirements, the permit condition cannot actually mandate future capital expenditures or expansions. Submission of plan and schedule seems consistent with the expression of the planning requirement as a goal, which is acceptable. We question whether the permit can require (under threat of permit violation) identifying contracts, ordinances, methods of financing and other arrangements necessary to actually accomplish the goal.

Response 21:

These elements in the permit are ways that Tacoma can surmount the problem of being above 85 percent of design capacity. We are simply looking for recognition from Tacoma and an annual update letter stating the city's plan of action.

Comment 22:

S4.E - I&I Evaluation. Questions have been raised about whether this is appropriate given that such an evaluation has been completed, there is an on-going I&I program which will continue and the area served by this plant is already built out.

Response 22:

As stated above, the collection system is old and will require vigilance. Therefore a continued I/I program will be required.

Comment 23:

S5.E. Preventing Inflow Connections. This requirement should state only that we should enforce our sewer ordinances. It is inappropriate to include the term "strictly" with reference to how we enforce our ordinances because it creates difficulty in how the permit "requirement" is to be interpreted. Also, our ordinance (as all of them do) prohibits connection of storm facilities to the sanitary sewer.

Response 23:

The I&I program is important to maintaining the ability of the plant to function within flow limits. *It is important to strictly enforce the ordinances, otherwise, why enact an ordinance?*

Comment 24:

S6A.I.f. The term non-domestic users is too broad. The list should be limited to Significant Industrial Users.

Response 24:

The pretreatment program is intended to address problems where any discharge may cause upset in a treatment plant. This language will remain in the permit.

Comment 25:

Page 21 of 36 - 4. It is unreasonable to try and identify all peaks. There is the possibility of unreasonable numbers of non-substituted aliphatic compounds. There should be a limit on the number of peaks that are identified. The next 10 or 20 highest peaks beyond target compounds.

Response 26:

This requirement is reasonable and will remain in the permit.

S8 and S9 - WET Limits:

Comment 27:

In addition to the comments that the testing has shown to be unreliable and consistently generate false positives:

The Agency must have a reasonable potential analysis to impose more stringent requirements, and it must be reliable. WAC 173-205-130 itself states that if there is a WET limit, compliance requires a minimum of three tests. We note also that the federal WET rule has been challenged and may be overturned. There is no applicable TMDL, and the part of Commencement Bay to which the plant discharges isn't 303(d) listed for any of the pollutants in the effluent. Prior testing results only indicate the need for additional characterization under WAC 173-205-040.

Response 27:

WAC 173-205-130 describes performance-based WET limits. Performance-based WET limits are not a part of this permit. No federal rule concerning WET has been overturned. Until the requirement for WET testing has been overturned in court, we will continue to require WET testing as outlined in rules and policy. Additional effluent characterizations for WET are the subject of WAC 173-205-060 (not WAC 173-205-040). No chronic WET testing has been conducted on the discharge since 1993 and significant changes have occurred in the treatment plant and population served. WAC 173-205-060 specifies a new effluent characterization under those circumstances and this is reflected in the permit requirements. As noted above, Commencement Bay is listed. There has been repeated toxicity shown in acute WET tests and an acute WET limit will be required until testing shows otherwise.

Comment 28:

Only appropriate role for WET is to include testing, and perhaps toxicity identification and/or reduction evaluation requirements in the event of failed tests. Results probably should be based upon a percentage of failure over a number of tests, and retesting must be allowed to account for variability in testing and in conditions.

Response 28:

The permit is based on regulations and permit language developed in 1992 - 1993 and used acceptably in many permits since then. The permit language provides for WET testing and toxicity identification/reduction evaluations (TI/REs) if needed.

Comment 29:

No legal authority to set a "contingent" effluent limit in a permit (i.e. the chronic WET limit). If a change in the effluent limits for the permit is needed, it should be the subject of a permit modification.

Response 29:

The permit is based on regulations and permit language developed in 1992 - 1993. The permit includes adaptive management language that implements WET limits without the need for additional regulatory actions. At this time there is no chronic WET limit only chronic characterization. The new permit is written so that if there is a WET limit violation, then a limit is imposed.

Comment 30:

Even WET testing ought to be automatically sunsetted if it does not show adverse results.

Response 30:

WAC 173-205-120 provides for removal of a WET limit if the last three years or more of test results meet the performance standard defined in WAC 173-205-020. Additionally, S8.B includes the following statement, "If the permit is not rewritten after five years an no acute test has shown less than 65 percent survival in 100 percent effluent, then the monitoring frequency may be reduced to once per year."

Comment 31:

Reporting timelines in Condition S3 are insufficient for WET test results ... there are not many labs that can do them. Also, the requirements in Conditions S8 and S9 to commence additional weekly testing in the event of a single failed test do not make much sense when: the results will postdate the event sampled by about 45 days typically, and there is no reason to suspect that a single failed WET test is representative of an ongoing discharge.

Response 31:

Labs meet these timelines routinely for other dischargers. The condition will remain.

Comment 32:

Page 22 of 36 - B. The City has been doing biomonitoring for 10 plus years. We know that any toxicity is either ammonia or chlorine. We have never had toxicity at the ACEC. There is no reason to do compliance testing every other month. Quarterly or semi- annually would be more then sufficient. Third paragraph under (B) improperly states permittee is "in violation of the effluent limit" when there is a test failure because the section clearly states in (A) that the permittee is in compliance with the permit even if there is a failed test as long as additional testing is being conducted as described in the permit.

Response 32:

The testing schedule meets the minimum requirements required and will remain in the permit. No recent testing has been conducted (10 years) to recharacterize the effluent. A city this size can change greatly over that time.

Comment 33:

Page 24 of 36 - S9 A. The City has been performing toxicity testing for more than 10 years. An effluent characterization was performed in the past. It is excessive to re-characterize at the frequency of every other month. The effluent could be re-characterized at the frequency of semi-annually or quarterly.

Response 33: See response above.

Comment 34:

Page 27 of 36 - F. 2. The interim temperature requirements are excessive. It should state that the sample must be cooled or put on ice.

Response 34:

The temperature requirement is a minimum and a standard procedure that will be required in the permit. Putting the sample on ice should achieve this goal, but the sample temperatures must be checked at the lab and errant samples rejected.

S10 - SSO Elimination:

Comment 35:

(A) Must be expressed as a goal rather than a requirement. We think this is the intent. We have difficulty with the use of the term sewage overflow b/c there can be leaks in the system that do not discharge to water.

Response 35:

We realize that the on-going I/I, and collection system rehabilitation is on a 75+ year *replacement program*. In that sense the program is a goal because it has gone on longer than the last permit cycle and will need to continue beyond the next. However it should be clear that discharges from the SSOs are not allowed and must be reported. This section of the permit has been rewritten from the first draft to make it clear.

Comment 36:

Imposing on the City the goal of eliminating all SSOs in the entire "collection system" also does not reflect the fact that the City is not responsible for ownership and maintenance of private side sewers. We do not have control of contract collection systems and can't be held responsible for I&I removal here.

Response 36:

A sewage leak to ground is also a serious problem that can contaminate ground water and attract vectors. The term sewage overflow will remain.

Comment 37:

G16 - Upset. This section refers only to "technology based permit effluent limitations" when the permit now includes water quality based ones. It must be changed to accommodate both.

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Response 37:

The upset defense only applies to violations of technology-based effluent limits.

Comment 38:

G18 - Duty to comply. Erroneously states that every permit noncompliance is a violation of the Clean Water Act and grounds for enforcement. Not all requirements are based in federal law. In addition, even it is based upon state law, the penalty provisions between the two are different and should be reflected in the enforcement of the various permit conditions.

Response 38:

G18 correctly states that all permit noncompliance is a violation of the Clean Water Act. This requirement will not be removed or amended.

The Fact Sheet:

Comment 39:

Page 1 paragraph 3 - At this time we do not agree that errors and omissions have been corrected.

Response 39:

Comment noted.

Comment 40:

Page 4. Table line 3 column 2 Is Gove ST not Grove ST

Response 40:

This item has been corrected.

Comment 41:

Page 4 next to last paragraph. Delete "compactor for disposal" and insert "washer."

Response 41:

This item has been corrected.

Comment 42:

Page 6 states that there have been 6 "violations" for exceedance of flow, all in 1999. The amount of flow in and of itself is not a violation of the permit, nor should it be.

Response 42:

Flow was a limit in the 1990 permit, therefore any exceedance of the monthly or weekly limits are violations of the permit

Comment 43:

Page 7. 95th percentile is a factor applied only to pollutants, not to flow.

Response 43:

The 95th percentile is only used to characterize the flow. By showing that the flow for the last two years was at 7.3 mgd for the 95th percentile it shows that the facility was above 7.3 mgd in 5 percent of the events recorded.

Comment 44:

Page 7, flow exceedance should not be a permit violation because it has no effect in and of itself on water quality.

Response 44:

The Department respectfully disagrees. A plant is designed to handle a certain flow. Exceedance of that design flow undermines the ability of the plant to effectively treat the wastewater and meet water quality standards.

Comment 45:

Page 7 (Also page 14-15): There is see no legal authority for imposing a performance based limit for fecal coliform. The effluent limit is clearly stated in WAC 173-221- 040(2) as 200 org/1 00 ml monthly and 400 org/1 00 ml weekly; the "alternative" limits of 173-221-050 do not apply, but even if they did, they do not provide any different standard, and they have not justified the need for any more stringent limit because they have not properly characterized ambient conditions. For the same reason, there is no basis for imposing a chlorine limit. What is presented in the Fact sheet is based on speculation that more chlorine will have to be added to address fecal coliform. There is no "reasonable potential" analysis with respect to fecal conform, and the reasonable potential analysis Ecology did for chlorine shows no limit required.

Response 45:

See previous responses regarding fecal coliform and chlorine.

Comment 46:

Again, we question the legal authority for setting a limit that, by design will not be met by a superior performing plant.

Response 47:

See previous response.

Comment 48:

Page 8. If there is no industry and no pollutants likely, do we need to do the priority pollutant analysis required under the Pretreatment section of the permit for this plant?

Response 48:

There is great uncertainty as to the existence of industries which should be permitted in this service area. Presuming the City means to assert that no industry locate in this area and presuming whether the City has discovered any significant industrial users discharging to the NETP, there can be little doubt that the service area of the NETP still includes dental offices, photo processors, dry cleaners, and other uncontrolled sources of pollution. These sources, taken together, represent significant loadings of pollutants discharged to the NETP. Our intent is that these pollutants would be identified in a priority pollutant analysis. Also, new loadings could occur if the City has missed finding existing industry, if existing businesses cause problems by discharging new wastestreams or periodic slug discharges, or if new industry was to begin operating in the area before obtaining the proper permits. Our finding is that in the case of the NETP, because of the size and nature of the service area, the POTW should perform at least the sampling required in exercising due diligence in attempting to identify potential new sources of pollution at the earliest possible date.

Comment 49:

Page 8 Table 2 TSS Influent Loading = 11,366 (see Table 4.4 Parametrix 1994)

Response 49:

Change made as requested.

Comment 50:

Page 10 Paragraph 2. Monthly effluent mass loading for TSS should be: $11,366 \text{ lbs/day} \times 0.15 = 1,705$

Response 50:

Change made as requested.

Comment 51:

TSS Weekly effluent mass loading should be: $1,705 \times 1.5 = 2,557$

Response 51:

Change made as requested.

Comment 52:

Page 8. It is not accurate to state that “the most stringent” of technology based or water quality based limits must be applied. The WAC, 173-220-130, provides that the different standards are to be used (1) “whenever applicable,” or (2) whenever necessary to meet water quality standards, which is determined

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by a reasonable potential analysis. It is not as if we have a TMDL or WLA in place either that would justify a different analysis.

Response 52:

The Department disagrees. This is the foundation of all NPDES permits. This language will remain.

Comment 53:

Page 10. The standard for permits is typically promulgated technology standards, and AKART. Surface water quality based limits are not required for a permit simply when they are more stringent or potentially more stringent...they are supposed to be used when there is a reasonable potential for violating water quality standards. There has been no such analysis for this discharge, therefore, there is no trigger for WQ based standards.

Response 53:

The conventional parameters were reviewed and compared to background water quality as typically done for all discharges to waters of the state. This work is shown in the fact sheet under the heading Surface Water Quality-Based Effluent Limitations and more specifically on page 13 where fecal coliform is examined. The Technology-Based Standards are only part of the equation for any outfall and must be met for all discharges at the end of the pipe. With the allowance of a mixing zone it is assumed that most discharges can meet the conventional water quality parameters at the edge of the mixing zone. If, however, the water quality is degraded or there is not enough dilution, the permit will receive a water quality-based permit limit.

Comment 54:

Even with respect to toxic substances, water body specific revisions are not made to the published water quality standards unless they are "needed." 173-201A-040.

Page 11. The fact sheet does rely upon the Parametrix dilution analysis for some purposes, and should allow us to rely upon it for others, i.e. the characterization of the fecal coliform levels in the immediate vicinity of the outfall.

Response 54:

As noted above, the dilution will be reevaluated using a higher flow of 10.3 which is a calculated dry weather design flow based on a peaking factor. Using this flow and the Parametrix dilution analysis the dilution was 45 for acute and 101 for chronic.

Comment 55:

Page 13. The critical conditions for Commencement Bay use ambient data taken from a monitoring station in a different WRIA from the outfall. Conditions at the ambient monitoring station are heavily influenced by the Puyallup River. They are not influenced by the NETP outfall (see the 1994 facility plan by Parametrix).

Response 55:

The old information provided by Tacoma and used by Parametrix is overshadowed by the more recent data from the Department. The Parametrix study did not conclusively dismiss this station and used data from the Commencement Bay monitoring stations (e.g., Table 5.8 used station CMB003).

Comment 56:

Page 14. Temperature section concludes a limit and monitoring are not required, yet temperature monitoring is required in S2. There should be no effluent temperature monitoring requirement.

Response 56: Tacoma is correct. Temperature monitoring will be removed from S2.

Comment 57:

We question the description of the data for fecal coliform in this section of the fact sheet. For example, a monitoring station in the center of Commencement Bay is not representative of conditions in the vicinity of the outfall of the North End Plant. (The Parametrix study provides more information about ambient concentrations of fecal coliform).

Response 57:

See responses above.

Comment 58:

There is no determination of what ambient conditions are, only a statement of what monitoring results were at a given monitoring station. Ambient conditions may determine what the water quality standard should be, i.e., if ambient conditions don't meet the standard, the standard is whatever the ambient conditions are. There is no reasonable potential analysis to justify a water quality based limit, and the part of the bay to which the plant discharges is not 303(d) listed for Fecal coliform. No performance based limit for Fecal coliform can be required until there is a TMDL or some sort of waste load allocation. Ecology's Permit Writers Manual states that performance based limits are intended to prevent an increase in loading until a TMDL and WLA can be completed. In addition performance based limits should be designated "interim" until a WLA is completed

Response 58:

The old information provided by Tacoma and used by Parametrix is overshadowed by the more recent data from the Department. The Parametrix study did not conclusively dismiss this station and used data from the Commencement Bay monitoring stations (e.g., Table 5.8 used station CMB003).

Comment 59:

Page 14 and 15. Reasonable potential analysis on toxics concludes no reasonable potential to violate water quality standards, even for chlorine. There is no basis for adding a water quality based limit for chlorine on a mere assumption that the plant will have to use more chlorine to meet a fecal standard, particularly where the fecal requirement is not warranted.

Response 59:

See previous responses.

Comment 60:

Page 15 paragraph 4. Ecology's Permit Writers Manual states the performance based limits are to be used to prevent an increase in loading while studies are completed to determine appropriate limits based on a TMDL or WLA. They are not contemplated as an instrument to force permittees to reduce a discharge.

Response 60:

The permit limit for fecal coliform is not intended to force a reduction. Rather it is a limit designed to allow only the existing level of discharge until a TMDL can be completed on the impaired waterbody.

Pages 15-16. WET Testing:

Comment 61:

Ecology has determined through reasonable potential analysis that NETP effluent has no reasonable potential to violate water quality standards. There is no basis for an acute WET limit.

Response 61:

The WET testing and reasonable potential testing are separate processes for establishing different kinds of limits. WET limits require direct testing of the effluent and *are* therefore different from the reasonable potential test for toxics.

Comment 62:

We question the conclusion that acute toxicity testing has shown a reasonable potential for violating water quality standards. The testing is notoriously unreliable. Ecology's determination appears to be based on one or two tests. Moreover, even "failure" of some of the tests, if that can be defined, does not constitute a reasonable potential for violating a water quality standard.

Response 62:

RCW 90.48.520 requires permits to have limits for overall toxicity. There have been repeated occurrences of WET test violations by the applicant and an acute WET limit is therefore required. See more responses to WET testing comments above.

Comment 63:

WAC 173-205-040 only discusses the conditions that indicate the need for effluent characterization. They do not address WET limits. The WAC itself indicates only that characterization might be indicated if there has been an exceedance of an acute or chronic WET performance standard in the last 5 years. Our comments on the permit itself indicate that if sufficient “failures” are demonstrated in WET testing, then a TI/RE evaluation is probably the next appropriate step.

Response 63:

The permit requires an effluent characterization for chronic WET, compliance monitoring for an acute WET limit, TI/REs when needed, and monitoring to determine if the WET limit will be needed in future permits or not. All of these requirements have been standard in Washington State permits for about ten years and are based on chapter 173-205 WAC.

Comment 64:

Page 18. Monitoring of ammonia and metals shouldn't be required merely to keep characterizing the effluent because we have been doing that for years. DOE has concluded no industry discharges to the North End plant, and there is no reasonable potential for violating water quality criteria. For the same reason, we question why the requirement to sample influent, primary clarified effluent, final effluent and sludge for toxics to characterize the industrial input. Was this just boilerplate?

Response 65:

Because of the size of this facility and its urban setting there is great potential for toxic discharges and changes in the character of the discharge over time. It is therefore important to keep testing for parameters that we feel Tacoma should be on the lookout for. This testing is the minimum testing for a facility of this size. The Department has concluded that Tacoma is unaware of any significant industrial users discharging to the North End plant, not that there are not SIU's that discharge to that POTW. The results of monitoring provide a baseline of data for TMDL activities and for evaluating the overall effectiveness, long term trends, and need for further programs to address minor industrial users.

Comment 66:

Acknowledging that the WACs allow it, we still question why design criteria must appear, as permit conditions, particularly flow, in light of the fact that the service area is built out and serves no industry, and the fact that the City has undertaken and completed an extensive 1/1 identification and removal effort.

Response 66:

See above response. Without limitations on design criteria the City would be under no legal constraint preventing it from allowing connection of far more customers than it has the ability to serve to the standards of treatment called for by the Department's Criteria for Sewage Works Design. Such additional flows and loadings would then prevent the POTW from meeting the reliability and redundancy required of other POTWs in this state, and could easily cause significant violations of permit requirements. In applying the law's requirement to provide a reasonable level of treatment, we have developed this proactive process as the best way of ensuring that new POTW capacity is constructed before current design capacity is exceeded.

Comment 67:

Page 20 Tacoma's DOE approved Pretreatment Program Document contains agreement letters from each contributing jurisdiction that acknowledges an "Interlocal Agreement Area Significant Industrial User Notification Procedure" which requires the agency to notify Tacoma prior to issuing permits to any industry desiring to connect to the agency's wastewater collection system that may qualify as a "Significant Industrial User."

Response 67:

The Department does not concur that the existence of interlocal agreements precludes the permit from requiring the City be vigilant in detecting sources of wastewater. The City, rather, needs to conduct a survey to double check that these systems are, in fact, detecting new industry that should be subject to a permit in time that they can be integrated into the permitting process before they commence operations.

Comment 68:

Page 20, bottom paragraph under "REQUIREMENTS FOR PERFORMING AN INDUSTRIAL USER SURVEY." The second sentence refers to developing a list of Significant Industrial Users (SIUs) and Potential Significant Industrial Users (PSIUs). Reference to PSIUs should be deleted. Also within that sentence is the reference to the POTW determining which industries requiring issuance of a state waste discharge permit or other regulatory controls. Tacoma does not have the authority to make decisions on the issuance of state waste discharge permits.

Response 68:

Potentially Significant Users are important to monitor as well. The information gathered by Tacoma in a survey may be used by the Department to make that determination. Although the City runs a mature pretreatment program, it is still obliged to periodically revisit its Industrial User Survey on a recurring basis and confirm that all industries subject to the pretreatment program are under an appropriate control mechanism. Conversely, a signed survey form is needed to confirm that those industries which might be subject to the pretreatment program that are not under permit are not conducting operations for which a permit is warranted. This process involves periodically re-developing a new master list of businesses that are potentially significant, collecting signed survey information from these businesses, and then grouping the IU's into categories of "insignificant," "potentially significant," and "significant" industrial users.

Comment 69:

Page 21: Although the General conditions are stated as being based directly on state or federal law, at least one is inaccurate (GI 8).

Response 69:

We are unaware of an inaccuracies in Condition G8 .

Comment 70:

Page 28, Appendix B - Glossary, definition of "*Potential Significant Industrial User.*" Using the links provided by the Municipal Research and Service Center (MRSC) to both Washington Administrative Code and RCWs, I was unable to find neither this definition nor any reference to this term.

Response 70:

The definition for PSIU is provided in the fact sheet definitions to improve understanding. The definitions in the permit fact sheet are included as a convenience to the Permittee and need not be limited to those terms for which a legal definition is available. Definitions do not by themselves establish any requirement for the Permittee, and are therefore not permit conditions, however, where state and/or federal definitions for a specific term exist, the definitions of the fact sheet are designed to clarify what is meant when the term is used in this permit.

Comment 71:

There is no such definition in the Code of Federal Regulations governing pretreatment program development and implementation. Since there appears to be no basis in either state or federal law, this definition must be deleted from the Fact Sheet as well as the reference to PSIUs noted above.

Response 71:

The Department disagrees and will keep the definition as it further clarifies the intent of the pretreatment regulation. The definitions in the permit fact sheet are included as a convenience to the Permittee and need not be limited to those terms for which a legal definition is available. Definitions do not by themselves establish any requirement for the Permittee, and are therefore not permit conditions, however, where state and/or federal definitions for a specific term exist, the definitions of the fact sheet are designed to clarify what is meant when the term is used in this permit.

Comment 72:

Page 33 Performance Based Limit Calculations are incorrect see earlier comments.

Response 72:

The limit calculations were changed following Tacoma's recommendations.